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Forecasters' Accuracy Depends Upon the Subject

By Bruce Hoard
CW Staff

Just how accurate are the predictions made by assorted computer industry gurus that appear in the pages of *Computerworld* and other trade publications?

Sometimes they're a bit optimistic, sometimes they're a bit conservative, and sometimes they're entirely off the mark. Sometimes they're even right. It all depends on the subject of the prediction.

Take microcomputers, for example:

- Venture Development Corp. prophesied in 1977 that

20/20 HINDSIGHT

"purchases of computers and related products for home use will increase at an average 37.2% annual rate in the 1976-81 period" [CW, Feb. 28, 1977]. By 1981, the VDC analysts added, the market would grow to "about" \$178.7 million.

How close did those numbers come to reality? They were "pretty low," said David

Terrie, senior analyst/office automation for International Data Corp. in Framingham, Mass. Terrie claimed that the 1981 market share for home micros was closer to \$500 million.
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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

Revised Cobol-80 Standard Still Sparking Controversy

By Paul Gillin
CW Staff

HARTFORD, Conn. — Compatibility issues continue to dominate the controversy swirling around the revised Cobol-80 standard, which will be resubmitted by the American National Standards Institute X3J4 subcommittee for public review this year.

At a panel convened here recently to discuss the most recent revision of the proposed standard, industry representatives, who are also Data Processing Management Association and Ansi committee members, argued that they are not convinced

that the benefits of conversion justify the cost.

The issue is of particular concern to DP shops with large numbers of program modules written in Cobol 68 and Cobol 74, panelists said. Critics of the revised standard, which has been under continuous development, review and revision by an Ansi subcommittee for nearly three years, contend that too many of the revisions are cursory and that conversion would demand large blocks of programming time simply to conform to a standard.

They also note that vendors are still uncommitted to
(Continued on Page 12)

Fight Under Way to Save Federal Standards Program

By Jake Kirchner

WASHINGTON, D.C. — A Reagan administration decision to all but eliminate the federal government's computer standards program is encountering strong opposition from segments of Congress, the scientific community and the DP industry.

Under the fiscal 1984 budget proposal submitted by the White House a few weeks ago, the Institute for Computer Sciences and Technology of the National Bureau of Standards would suffer a 70% reduction; its funding would be cut from \$10 million to \$3 million.

ICST is charged by federal statute with developing federal computer standards and assisting government agencies in their DP use. In addition, ICST conducts computer science research and development and participates in national and international standards organizations.

According to the new budget plan, the remaining \$3 million in funds would allow ICST to continue its research in local-area networks and monitor developments in national and international standards committees.

The rationale for dropping the standards program from the NBS budget, according to NBS Director Dr. Ernest Ambler, is that standards should be the province of the private sector. Under the Reagan plan, the ICST

would monitor and assist private efforts in standards development and adopt their products to federal use where appropriate.

But during a hearing on this matter before a Senate science subcommittee last Tuesday, Ambler admitted that the government had not consulted private-sector organizations to see if they would fill the void left by ICST withdrawal from the standards process. NBS would try to push these orga-

nizations to become more active, he said.

Subcommittee member Sen. Frank R. Lautenberg (R-N.J.), a former DP industry executive, said he was "bewildered" by what he called the "pitiful" ICST budget proposal, particularly in light of the importance of the computer industry to U.S. economic health and given concerted foreign government efforts to support their own high technology
(Continued on Page 4)

HP, DG Sign Pacts With PBX Makers

By Bruce Hoard

CW Staff

PHILADELPHIA — Corporate compatibility vied with new products for the limelight at the Office Automation Conference here last week.

On the corporate side, Hewlett-Packard Co. and Data General Corp. continued the recent trend of computer processing hardware vendors joining forces with communications companies. HP announced agreements with digital private branch exchange manufacturers Northern Telecom, Inc., Rolm Corp. and Intecom, Inc. that will link HP 3000s to all models of their respective PBXs, the SL-1, CBX and IBX.

HP is considering similar

Coverage of OAC '83 continues on Pages 14 through 16.

pacts with other digital PBX vendors, according to Andre O. Schwager, general manager of HP's Information Networks Division. Immediate compatibility is available with the SL-1 and CBX. Intecom's IBX will be compatible within two or three months, Schwager said.

Data General Corp. revealed that it and Northern Telecom will develop an advanced capability for connecting DG's Comprehensive Electronic Office system workstations with the SL-1. Under the agreement, the companies will enhance
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Cary Steps Down From Post As Chairman of IBM Board

ARMONK, N.Y. — Frank T. Cary last week resigned as IBM's chairman after 10 years in that office. John R. Opel, who will continue as IBM's chief executive officer, will replace Cary as chairman.

Opel will be succeeded as president of IBM by John F. Akers, former senior vice-president and group executive of the Information Systems and Communications Group. Akers was also appointed to membership in the IBM corporate office, the body that provides overall direction to the company, IBM said.

Cary will not leave IBM altogether, but will remain a member of the corporate office and chairman of the executive committee of the board of directors.

In a prepared statement, Cary said, "We have a great management team in place, very capably led by John Opel... This is the right time for me to hand over to John the added responsibilities of chairman of the board."

Commenting on Cary's decade-long leadership, Opel said, "Frank Cary set the IBM company on course for today's successes and tomorrow's opportunities."

Cary joined IBM 35 years ago as a marketing representative and held various management positions before being named general manager of the Data Processing Group and vice-president in 1966. He joined the corporate office in 1969, and was elected president in 1971 and chairman and CEO in 1973.

Newly elected president Akers joined the company 23 years ago as a sales trainee in the San Francisco office and was appointed vice-presi-



Frank T. Cary

dent in 1973 following various marketing assignments. In 1976 he was named assistant group executive of the former Data Processing Product Group, responsible for worldwide development and U.S. manufacture of IBM's large and intermediate systems, high-performance storage systems, communications products and terminals. He was later named group executive of the Information Systems and Communications Group.

In a related announcement, Paul J. Rizzo, a member of the board of directors, was elected vice-chairman of the board. A member of the corporate office and Corporate Management Committee, Rizzo joined the company 25 years ago. He became vice-president of corporate finance and planning in 1970 and senior vice-president in 1979.

SBS Asks FCC To Let It Market Jointly With IBM

WASHINGTON, D.C. — IBM and Satellite Business Systems (SBS) should no longer be barred from joint marketing activities, an SBS senior vice-president recently told the Federal Communications Commission (FCC).

The market is now far more competitive than it was in 1975, when SBS — a joint venture of IBM, Communications Satellite Corp. (Comsat) and Aetna Life and Casualty — received its common carrier license from the FCC, SBS' William D. English said in a letter to FCC Chairman Mark S. Fowler.

When SBS received its license, the FCC insisted on separate marketing activities because of fears that Comsat would gain a competitive advantage in selling to the IBM customer base by, for example, bundling IBM product and Comsat service offerings.

"There are now a host of domestic satellite system operators, as well as other communications vendors," English pointed out to Fowler. "Under Computer II [the FCC's Second Computer Inquiry Decision], the commission has deregulated customer premise equipment and data processing products and services, as well as enhanced services. The Modified Final Judgment in the AT&T case opens the whole area of unregulated activities to AT&T."

Aside from being unfair to SBS, the restrictions "constrain users' competitive choices by inhibiting SBS and IBM from responding to user requirements with the same freedom as other parties," English added.

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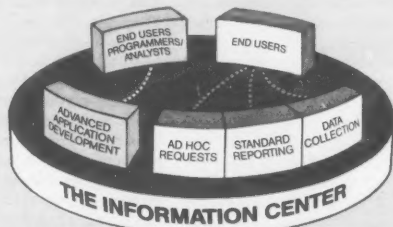
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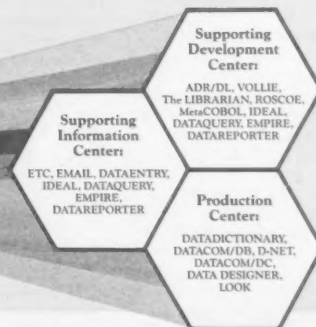
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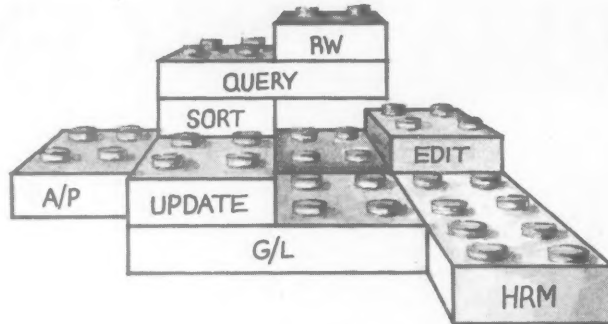
Factory Approach: New Way to Build Software

By Lois Paul
CW Staff

Just when you thought it was safe either to buy packages or develop your own software using structured methodologies, someone has come up with a middle course.

This chapter in the continuing saga of make vs. buy is called the component approach or the software factory technique. It involves reusable modules of code that handle the functions needed in most applications, such as update and edit routines. Users ideally select these modules at random, fitting them together into a package that best fits their needs.

Proponents of the reusable software concept liken its anticipated effect on applications development to the changes wrought by the industrial revolution. Several proponents contacted by *Computerworld* pointed to Henry Ford's introduction of stan-



dardized components and economies of scale to the manufacture of automobiles.

Merle Parks, product manager for Cincom Systems, Inc.'s Mantis, compared it to gun manufacturing.

"Originally, there were gunsmiths who created everything and every part was different. That was the way we were writing programs," he said.

Over time, the gunsmiths accumulated some of the same parts; similar-

ly, in DP, software developers began using subroutines. "Then when we got to the point when the structured revolution came around, we said, 'Let's get structured subroutine libraries out there that everyone will use,'" Parks said.

Several companies are already working on implementations of the component approach to software development. Raytheon Computer Services of Wellesley, Mass., brought out Readycode, intended to give Cobol programmers access to reusable development tools [CW, Nov. 2, 1981]. "What Readycode is providing is really an architecture, not just reusable modules and reusable code," Larry Martin, the firm's general manager, explained. "Instead of developing 4,000 to 6,000 modules, you end up with a single architecture and 60 modules."

Developing Readycode

In developing Readycode, Raytheon analyzed a number of programs and found they all fell into some combination of the following categories — edit, update, report or extract. What resulted, therefore, was a finite number of models; Readycode provides a reusable logic structure based on these models.

According to Martin, the logic structure is about 60% of the code. The reusable modules portion of it averages 20% to 25%. Unique code, which deals with data elements and so forth, is only 15% to 20%.

Another firm working on the reusable component concept is McCormack & Dodge Corp. Its Advanced Financial Systems (AFS) design methodology "is really an application of reusable code, and the code that underlies AFS can be used in any kind of system," according to John Landry, vice-president of research and development for the Needham Heights, Mass., firm.

Landry's R&D group, which develops financial software packages, recognized that portions of the software they were writing performed the same functions. What was needed was a means of defining data independent of the code so the functions could be defined generically. They developed reusable pieces of code at the lowest level of data manipulation, which Landry called the "normalizer," to handle data I/O.

"One of the functions of the normalizer is that you can have a date in any known format and it will figure out if that is a valid date," Landry said. "Programmers go to great lengths to make a fancy algorithm to edit dates and it already has been done a thousand times."

Parks and others contacted by CW referred to the Department of Defense-sponsored Ada language development effort as related to the eventual proliferation of the component method of development software. "Ada has a strong concept of separating the description of what something does from the implementation of how it does it," explained Chris Braun, director of quality assurance for Softech, Inc. of Waltham, Mass. By doing this, a software developer can look at the specification part and be able to tell whether it can be used in a different place.

It Could Change Management's Perception

By Lois Paul
CW Staff

Changes in the way corporate management perceives software may result when DP shops begin building software systems from reusable modules.

American businesses generally consider software a corporate expense rather than a corporate asset because they tend to throw their packages away and buy new ones every five to seven years, when their businesses change, observed Larry Martin, general manager of Rayth-

eon Computer Services. If companies take advantage of reusable software modules, he believes they will have to change only the 15% to 20% of the code that is application-specific. The remaining 60% to 75% can be considered a corporate asset which has continuing value.

However, to use the reusable component technique, management philosophy regarding software development also must undergo a change. The message will have to come from above that packages are to be developed in such a way that they can be

easily reused.

Some resistance within the DP staff to reusable modules of code involves the perception that they already are doing this and it will not fulfill their specific needs. Once users get past the "not invented here" syndrome, Martin said, they will recognize that the reusable module approach ends many of the mundane tasks and frees programmers to do more systems analysis.

Robert Jepson, vice-president of Custom Software, Inc. in Irvine, Calif., said that if this concept catches on, other advantages for users will be quicker development of systems and the availability of more reliable software.

"The negative side is that they would be somewhat restrictive because standard software would only do 'n' things and the user always wants something else," Jepson said.

Although he is "optimistic" about the reusable software concept, Dr. Stephen Crocker, principal director of The Aerospace Corp. in El Segundo, Calif., said there still are problems with this approach which he hopes will be ironed out. The first is that functional specifications have to be clear and modular enough to be reused. This relates directly to the development of standards for modules, he explained.

Potential Problem

The other potential problem, according to Crocker, is efficiency and performance of reusable modules. His feeling is that general-purpose modules tend to be less efficient than specific versions tailored to the application.

"My hope would be that we would have tools that would be smart enough to do that tailoring on the fly as part of the factory process," Crocker said, referring to the possible application of artificial intelligence techniques.

"I am hoping that there will be powerful enough approaches, rather than 'a hope and a prayer' approach applied to make it work," Crocker said.

Fight Under Way to Save Standards-Making Body

(Continued from Page 1)

industries. Noting the rapidly increasing American defense budget and increases in other government R&D support programs, Lautenberg asked of the ICST budget, "Is this the only place we're going to [reduce] the deficit?"

More Critical

Other hearing participants were even more critical of the ICST budget. Dr. Mildred Dresselhaus of MIT, who chairs the National Academy of Sciences' NBS evaluation panels, called the ICST budget cut "particularly devastating and imprudent."

Dresselhaus noted the important role ICST plays in the International Standards Organization. She said the federal government must remain active in standards development because the government, as a large computer user, must be represented and because ICST participation amounts to representation for "the weaker elements of the public sector."

Jack Biddle, Computer and Communications Industry Association president and a longtime advocate of government participation in standards development, told the Senate subcommittee that the ICST budget is being cut because it has been too

successful.

Biddle blamed the cuts on lobbying by large DP vendors who, he charged, are afraid an open standards process will eliminate their position as de facto standards setters — a position they hold, he said, by virtue of their large market share.

Biddle also pointed to government estimates that the federal standards program has saved the federal government millions of dollars in procurement costs by increasing competition. "Ten million dollars per year to procure and utilize more intelligently \$20 billion a year worth of [government] goods and services seems to be an extremely small price to pay," according to Biddle.

Federal government concerns aside, Lautenberg suggested that reducing ICST standards activities means "relinquishing a substantial part of our responsibility" to the economic future of the country. "We ought to extend the [ICST] operation and be funding it more aggressively," he said.

Dresselhaus added, "When one person's widget doesn't meet with another person's widget, it's the consumer that has the problem with the interface, and that's where the bureau can be very helpful."

Cites Finances, Not Performance

Insurer Fires 41 DPer Without Warning

By Jeffrey Beeler

CW West Coast Bureau

SAN RAFAEL, Calif. — Systems specialists have become the latest targets of a major insurance company's continued effort to rid itself of what it apparently regards as unnecessary employees.

In a Feb. 9 move that reportedly caught its victims by surprise, Fireman's Fund Insurance Co. summarily trimmed 41 programmers, analysts and other workers from its approximately 770-member central computing staff.

On the morning of their dismissal, each of the 41 employees was suddenly approached by his or her superior and given 10 minutes' notice to appear in one of several company conference rooms. There, in groups of approximately 10, the workers were handed packets of information outlining the firm's employee benefits and were informed of their employer's decision to dismiss them immediately, according to one of the casualties, programmer Keith Hayenga.

While the employees were in the meetings, Fireman's Fund was eliminating the workers' system identification numbers and was changing its IBM TSO access codes, according to a second ex-staffer, who asked not to be identified.

Differing Opinions

Opinions differ widely over exactly what the recent personnel cutbacks mean. Hayenga and the other ex-staffer characterized the dismissals as "layoffs" and held out hope that some of the workers might ultimately be rehired.

However, the company's senior vice-president of systems, Jerry Sommerhauser, disputed the employees' interpretation of the action and described the cutbacks as "firings" that are unlikely to be reversed anytime soon.

Opinions also diverge widely over the question of what prompted the personnel dismissals in the first place. Hayenga spoke of the cutbacks as an economizing move aimed at "freezing" the company's DP budget.

Sommerhauser, however, attributed the dismissals partly to the current economic slowdown, which has produced a 50% dip in the firm's typical systems department turnover rate. He further blamed the staff cuts on a sudden dropoff in the company's internal requirements for new automated services. "We've just finished several large application development projects, and we suddenly

Security Group Forms

LOS ANGELES — The Information Systems Security Association has been formed here to promote the exchange of information related to information systems security.

Meetings of the nonprofit group will be held in Los Angeles.

Annual dues are \$30. More information can be obtained from Information Systems Security Association, P.O. Box 71926, Los Angeles, Calif. 90071.

found ourselves with more people than we have work to do," he said.

Although the staff cutbacks left no part of the Fireman's Fund systems organization unscathed, some groups clearly suffered more casualties than others. By far the hardest hit employees were the application programmers, according to the ex-staffer who asked not to be identified. Only about two people lost their jobs in the company's system programming section, with an equal number dismissed from its technical writing and advanced technology departments.

Some of the now-unemployed system staffers had worked at Fireman's

Fund for nearly 25 years, according to Hayenga, himself a nine-year veteran of the company.

Similar Reduction

The Feb. 9 dismissals came only about two months after a similar staff reduction that cost approximately 180 nonsystems people their jobs in the firm's nearby life insurance subsidiary, Hayenga said.

Part of the reason the cutbacks came as such a shock to the firm's employees is that Fireman's Fund has earned a reputation over the years for going to great lengths to avoid letting its people go, Hayenga said. Another reason the dismissals

took their victims by surprise is that Fireman's Fund has only recently completed one of its most profitable quarters on record — hardly a tell-tale sign of an impending staff cutback, Hayenga added.

Although the staff cuts for the most part were conducted amicably, at least one of the dismissed employees objected to the company's decision to announce the cutbacks without notice. "We were given absolutely no opportunity ahead of time to transfer to other positions within the company or to seek work at another employer," according to the ex-Fireman's Fund systems employee who requested anonymity.



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Prime Users Irked by Users Group Policy

By Susan Blakeney

CW Staff

BOSTON — People were grumbling at a recent Eastern Region Prime User Group (PUG) meeting here. But they weren't criticizing Prime Computer, Inc.'s product line. Instead, they were dissatisfied with

Should Prime Fund PUG?

By Susan Blakeney

CW Staff

If Prime Computer, Inc. directly funded the Prime User Group (PUG), its policy excluding competitive vendors from group meetings might be understandable. However, this apparently is not the case.

At a recent PUG meeting in Boston, one PUG official took issue with Prime's lack of financial support for its users group.

"Prime says it supports its users group because it has provided some staff and equipment at these meetings... but that's not financial support."

"They said they spent \$160,000 for our national meeting. That's less than the cost of one Prime 750 machine," the source, who requested anonymity, noted. Digital Equipment Corp. and Hewlett-Packard Co. finance their respective users groups, and the PUG spokesman feels Prime should do the same.

On the other hand, some members of the users group think Prime should keep its money and leave the policy making to the users group.

"I'd like to see the users group completely funding itself and maybe staffed by one full-time person acting as a center for communication... and maybe a biannual newsletter," said Jim Requa of Exeye Software Tools, Inc. PUG currently operates with no paid staff, no newsletter and no membership dues, he added.

"I think the value of a users group is threefold," Requa continued. "Its goal is to provide communication between users, communication between users and Prime and communication between users and other vendors."

"The users group should be completely independent of Prime in order for the second point to be effective," he maintained.

Michael Causer, a Prime user from CIS, Inc., agreed with Requa on the issue of Prime not funding the users group. "Funding is not critical. If there were no strings attached it [funding] would be fine."

"If they said, 'You damn well better do as we say' then you'd have to tell them where to get off."

In terms of providing staff and equipment at the meetings and refusing to let competitive vendors attend the same show, Causer likened the situation to charitable donations: "I don't expect to govern WGBH's [Boston's public television network] programming just because I donate \$50 to them."

Lynn Ladd, manager of public relations at Prime, said the relationship between Prime and the users group "has not been clearly defined yet."

their users group.

Many Prime users feel that a variety of vendors, even those that compete with Prime, should be allowed to exhibit their wares at PUG gatherings. But Prime's corporate policy forbids such participation, noted a PUG official who asked to remain anonymous.

"Third-party hardware vendors drove Prime crazy at the New Orleans meeting," the official said. Prime was "so appalled someone else was there selling memory and peripherals."

"Prime's new president, Joe Henson, was aghast at the fact that there were competitive vendors there. He established a new policy: Prime will attend only if vendors stay home."

Users Holding Ground

However, when the time grew near for its recent regional meeting in Boston, the users were still holding their ground, and Prime's official policy softened, the PUG source reported. "They said they'd go only if noncompetitive vendors were allowed," such as Prime-compatible software firms, as opposed to vendors of memory, disk drives and various related hardware peripherals.

Thus, Prime was on hand for the meeting and concurrent exhibition, as were some 26 noncompetitive sellers of primarily application software.

However, at a meeting on the second day of the conference, "the users almost unanimously voted to allow all vendors at the next regional meeting," slated to take place in February 1984 in Baltimore, according to the

PUG spokesman.

"We feel that Prime will probably never offer specialty software, so it's only fitting that we be able to see it from other vendors." In addition, the PUG official contended that Prime's pricing structure is inequitable, alluding to Control Data Corp.'s disk drives, which are incorporated in Prime systems and sold at twice the CDC price.

"Third-party people help keep prices down," agreed Michael Causer, vice-president of CIS, Inc. and a veteran Prime equipment user.

"It's against Prime's best interest to have this policy," added another Prime user, Jim Requa, vice-president of Exeye Software Tools, Inc. "The more activity that occurs around their machines, the more interesting their products become," he reasoned.

"In other words, every vendor that sells products to be used with Prime computers is also pushing Prime computers," Requa said.

At the same meeting, users voted on the same issue regarding an upcoming national PUG meeting, scheduled for June in San Francisco. "There was a mixed consensus on this," recalled Hal Borns of Phoenix Systems in Lexington, Mass., who was named to the newly created post of secretary-treasurer. "Many people felt that private vendors should limit their exhibitions to the regional meetings."

Lynn Ladd, Prime's manager of public relations, said Henson's corporate policy preventing competing

Eastern PUG Elects Officers

BOSTON — Ray Grande was elected president of the Eastern Region Prime User Group (PUG) during its recent annual meeting here. Grande is administrator of computer-aided design and manufacturing at Raytheon Data Systems Co. in Norwood, Mass.

Also elected were Judy Peters of ARA Government Services, Inc. of Baltimore, who was named vice-president; and Hal Borns of Phoenix Services in Lexington, Mass., who was named to the newly created post of secretary-treasurer.

PUG's upcoming national meeting will be held in San Francisco June 19-23. Further details are available from Dr. William Lenharth at the University of New Hampshire, Petter Brook Offices, Durham, N.H. 03824.

vendors from attending user meetings now pertains only to the national PUG meetings.

As for the next Eastern regional meeting at which users are insisting on inviting any and all vendors, Prime is sticking to its policy at this point.

"That's what they're saying, but I cannot envision that happening," commented Ray Grande, the regional PUG president.

Predictions' Accuracy Depends on Subject

(Continued from Page 1)

tion and that during 1980 and 1981 the market grew at least 100% per annum.

However, Terrie was quick to point out the liabilities of looking into the future six years ago. He noted how few major micro vendors existed then and pointed to what he called "a complete software drought."

Dale Kredatus, manager of consulting services with Datapro Research Corp., called the VDC numbers for the home computer market "optimistic." The first computer kits came out at that time, generating widespread belief that the home computer boom was on. As it turned out, the new computers were too complex for popular use, he said.

Kredatus called the \$178.7 million projection for 1981 low, suggesting \$300 million was closer.

Creative Strategies, Inc. (CSI), another firm that makes market forecasts, claimed in 1978 that by 1982, the personal computer market would grow to \$3.5 billion and the portion of that market reflecting small business purchases would top \$1 billion [CW, June 12, 1978].

Terrie was impressed. "That was pretty good for the time [CSI] did it," he commented, noting corresponding IDC figures of \$3.8 billion and "over" \$2 billion. "Everybody thought that the home market would be much bigger than it has been and the business market would be much

Next week, in Part 2 of '20/20 hindsight,' a look at whether the predictions about a programmer shortfall were on target.

smaller."

But Kredatus disagreed with the CSI predictions. "That was a little overoptimistic," he said, declaring that today's micro market is approximately \$1.4 billion or \$1.5 billion. Kredatus pointed out the impact that IBM is having on the market; it expects to ship \$895 million worth of its Personal Computers by the end of this year.

How Did Predictions Fare?

How did predictions for the telecommunications market fare? Consider:

- VDC predicted in 1978 that the raster scan display market would grow 60% per year [CW, Dec. 11, 1978]. Both Terrie and Kredatus agreed with that rosy prediction, saying it was close to the mark.

- But both experts disagreed with a 1978 prediction from International Resource Development, Inc. (IRD) that the overall telecommunications service and equipment market would grow 4% annually, reaching \$88 billion in 1988. IRD said at the time that market segments able to compete with the Bell system would grow at much faster rates — 10% to 100% annually.

Terrie said the current growth rate is 10% to 20% and growing. And Kredatus called 4% conservative. He said "that sounds very good" of the higher growth rates for Bell system competitors.

- IRD claimed in 1978 that IBM would diversify into telecommunications more than any other area over the next 10 years [CW, March 27, 1978]. "I can't really say that that's true," Terrie stated. "It seems fairly clear that where [IBM is] diversifying is in the small systems and in terms of distribution channels as well."

But Kredatus thought IRD's telecommunications forecast was correct. He also agreed with an IRD claim stating IBM would feel mounting pressure to broaden its market base to include personal computers, consumer electronics and microprocessor-based control instrumentation.

- One last example of a notable prediction during the recent past emanated from Michael Killen, president of Strategic, Inc. In the Nov. 23, 1981 issue of *Computerworld*, Killen was quoted as saying that Xerox Corp.'s Ethernet local-area network would be a total failure within two years. "Xerox is headed for the worst failure in the company's history," Killen proclaimed.

Terrie took sharp exception to Killen's prediction, calling it one of the "worst" and "most irresponsible" he had ever heard. Kredatus agreed, saying Killen's claims were "not fair" and "misguided."

Threatens U.S. Firms' Operations Abroad

Pact Would Restrict Data Flow in Europe

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — U.S. corporations, struggling for years to ensure relatively free international data flows in the face of growing European data privacy laws and regulations, are now eyeing warily a new threat to their overseas operations, a soon-to-be-ratified European treaty that could greatly restrict data transfers to the U.S.

At issue is the Council of Europe (COE) convention for protecting automated personal information. Approved in late 1980, the treaty will have the force of law once ratified by its members. It will go into effect after five COE nations, of which there are now two dozen European countries, have signed it, which is expected sometime this summer.

The convention, although recognizing the value of "freedom of information regardless of frontiers," states that a signatory may restrict data transfers outside its territory to nations that do not have data protections equivalent to the originating country. The document sets out basic principles for data quality, security and record-gathering fairness and calls for a centralized enforcement body of member-state representatives.

U.S. Objections

The U.S. government has consistently objected to the treaty's rather rigid guidelines and enforcement mechanisms and has sought to emphasize instead the voluntary privacy guidelines developed by the Organization for Economic Cooperation and Development (OECD), of which the U.S. is a member.

Those guidelines have been endorsed by the U.S. government and by almost 200 American corporations. It had been hoped here that these endorsements, along with the existing body of U.S. privacy laws, would persuade European nations not to close down transatlantic data flows. The outlook for such a conclusion to the data flow debate has become increasingly clouded of late with the advancement of the COE treaty, especially when that development is coupled with other indications of possible data flow restrictions.

One such indication is the nearing completion of a British privacy law, which was drafted with the COE treaty obligations in mind and which apparently looks toward imposing data flow restrictions on nations —

such as the U.S. — which are not COE members and do not have the kind of omnibus privacy statute now common to Western Europe.

Although representatives of European nations have indicated during the last few years that it is unlikely all data flows to the U.S. would be cut off by the treaty, the absence of guarantees is troubling to U.S. DP and service firms, which rely to an extent on free data flow.

For example, Hugh Donaghue, Control Data Corp. vice-president and chairman of a State Department private-sector transborder data flow advisory group, said recently that COE treaty ratification could make

the OECD guidelines "a meaningless document." When the treaty becomes law for European nations, the U.S., as a nonsignatory, could find itself "in the position of being something of a second-class citizen," he said.

Responding to that at a recent meeting of the State Department advisory panel, Kenneth Leeson, of the National Telecommunications and Information Administration, noted that the OECD guidelines are voluntary and do not legally bind endorsers to their principles and acknowledged to Donaghue that there is "a real possibility" COE countries will not recognize endorsement of the

guidelines as sufficient proof of adequate privacy protection practices.

One State Department official suggested the U.S. could work out bilateral agreements with COE nations to ensure continued two-way data flows, but he added such negotiations take a lot of time and that the government has taken no action in that direction.

Noting the growing private-sector concern about the COE treaty, Donaghue suggested it might be disastrous to continue the present course, which he characterized as "we wait [until the treaty takes effect] and then say, 'Oh, my God! What do we do now?'"

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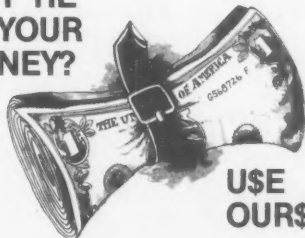


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Correction

In "BAI Plans Bank DP Auditing Certification" [CW, Feb. 14], it was reported that the EDP Auditors Association offers a Certificate in Information Systems Auditing. The certificate is actually titled Certified Information Systems Auditor. In addition, John Van Borssum is the associate chairman of the organization's annual conference, not the organization's associate chairman.

New Job Links DP, Personnel Management

By Marguerite Zientara
CW Staff

There's a new job in town and it combines two volatile and rapidly changing areas of interest — computers and personnel management.

The job is manager of human resource information systems. It reportedly exists in nearly 80% of all major U.S. corporations with over 5,000 employees.

The job involves "managing all the data an organization requires to utilize effectively and pay its people," explained Edward Goldmacher, president of the San Mateo, Calif.-based Association of Human Resource Systems Professionals. According to a recent salary survey done by the association, the typical manager of human resource information systems is in his middle to late 30s; is as likely to be female as male; is as likely to be a DP expert as a personnel expert (with a trend toward personnel); and earns \$38,000 to \$42,000 a year.

Those who hold the job — which is expected to be pervasive by the year 2000 — must be able to maintain, extract and present data in usable form to corporate decision makers. They are in charge of "very sensitive information regarding affirmative action plans, Equal Employment Opportunity, employment of the handicapped and so on," Goldmacher said.

Besides developing an integrated information system to handle human resource needs, the manager serves as a "liaison between data processing technical-type specialists and human resource management people, so we can communicate with both groups in order to get a system like this in place," explained Catherine Roberts, manager of human resource information systems for Northwest Bancorporation in Minneapolis.

Once developed, the human resource information system calls for "constant enhancement because we're working in a very dynamic, changing environment in human resources today, which is not the way it was 10 or 15 years ago," Roberts said. Human resource information systems managers must be able to respond to changes in compensation programs, government reporting needs and internal program changes. One of the biggest areas of concentration today is flexible benefit programs, "where employees can select from a core of benefits and choose additional ones within a certain realm of dollars," she explained. "You can't put a system like that in place unless you have a good computerized package to support it, or you'd never keep track of what everybody has selected, how much that's costing and the impact on the whole benefits program for the whole company."

Another key responsibility is education of senior management and other people in the company about the system's capabilities. "If it just sits out there and isn't used for the full capabilities that it has, then maybe the company's not getting the best value for its dollar," Roberts stressed.

Many holders of the job, "particularly up until three or four years ago, were strictly DP-oriented," Gold-

macher pointed out, "but we're now seeing a tremendous shift toward the functional user, toward the personnel professional."

Why? Small computers are becoming user-friendly enough to "be plopped right down in the personnel organization and put to work," and there is a wide acceptance of packaged software products available that require minimal DP support, according to Goldmacher. In addition, "we're rapidly hitting the point where the two lines cross — where software is cheaper than people and it doesn't pay to put a lot of resources into developing a human resource system because you can buy one at relatively cheap prices."

Finally, there is a shift in responsibility. "It used to be that anything that had to do with computers came under the realm of the DP department, which quickly locked itself behind a key-coded door," Goldmacher pointed out. "We are now, thanks to the advent of microprocessors, dispersing this information out, tearing apart the empires built by the DP people and laying more responsibility for the systems at the feet of the user."



Three Managers, Three Backgrounds

One has a background in personnel. One has a background in engineering and DP. The third has worked in both disciplines.

That's what *Computerworld* found when it interviewed three managers of human resource information systems last week.

Catherine Roberts of Northwest Bancorporation in Minneapolis is the manager with the background in personnel. "My feeling is that the background should be in human resources simply because if you don't understand what the needs are of the group who's going to use an information system, how can you put one in place?"

"DP people have to come around and learn what the needs are of that group before they can be effective in a user area," she added.

"On the other hand," she conceded, "I had to pick up a lot of technical knowledge through the years that you don't gain overnight."

What does the future hold for Roberts? She could do consulting work, set up information systems in other companies or move into another area of human resources, such as a vice-president or director position — becoming "more of a generalist," she noted.

Sidney Simon, manager of personnel information systems and benefits administration for Bechtel Power Corp. in San Francisco, is "an engineer that grew up in data processing." Simon held a similar position in another company before coming to Bechtel seven years ago, "except I was on the DP side, and I report into personnel management now," the manager maintained.

How did Simon become familiar with the world of personnel? "I've been working with personnel payroll systems for probably 12 years, even though I was on the other side

of the fence."

With a B.S. degree in industrial engineering and an M.S. in management science, Simon feels he has more options for his career path than others in his position might "because I'm technical and the company is technical."

Simon may expand into other areas of the company, such as commercial services or senior management administrative positions or into DP, he projected.

One human resource information systems manager based in Minneapolis has experience in programming and systems development; moreover, she has also worked in lower-level personnel research positions.

As the first holder — appointed 10 years ago — of her current responsibilities in a 35,000-employee company, she is "high enough up now that it is pretty hard to move" except laterally. Even then, "my background is so narrow in scope; it has centered around this area," the human resource information systems manager maintained.

Expressing her dissatisfaction with her company's DP department, however, she maintained, "Sometimes I feel I'd like to take over the place."

"What's happening is that I'm doing more and more of the data processing in my own department because the DP department as such is not answering my needs."

Immigration Bill Reintroduced With National ID System Intact

WASHINGTON, D.C. — Congressional sponsors of immigration law reform legislation — a bill that died last year amid considerable controversy over possible discrimination against Hispanics and over its national worker identification mandate — have reintroduced the bill in the new Congress.

Sen. Alan K. Simpson (R-Wyo.) and Rep. Romano L. Mazzoli (D-Ky.) resubmitted their Immigration Reform and Control Act Feb. 17.

The bill was approved overwhelmingly by the Senate last August, but widespread debate on the measure in the House of Representatives' Judiciary Committee delayed the matter in the House until the end of the 97th Congress last December [CW, Jan. 24].

The bill is controversial on several counts, not the least of which is its provision to penalize employers who

knowingly hire illegal aliens. To enforce this provision, the bill directs the president to develop a secure worker identification system to be checked by employers.

Civil liberties groups argue that the proposed documents, possibly backed by a centralized government computer system, would be in effect a national ID system, a concept long rejected by Congress.

The bill's supporters cite the legislation's prohibition against using the ID system for purposes other than employment, but opponents of the plan, including high-ranking administration officials, argue that the temptation to use the system for other purposes, such as tracking down draft resisters, would be irresistible to government agencies.

Initial hearings on the bill were scheduled for Simpson's Immigration Subcommittee Feb. 24-25.

In Face of U.S. Pressure to Drop It EEC Determined to Pursue IBM Antitrust Case

By Robert Batt

CW West Coast Bureau

BRUSSELS, Belgium — Pressure from the U.S. government to drop its antitrust complaint against IBM has made the European Commission more determined than ever to pursue its case, a spokesman for the commission said here recently. In fact, he said, there is a "grim determination" to see the case through to its conclusion.

Pointing to IBM's market aggressiveness since the dismissal of the U.S. vs. IBM antitrust case, the spokesman, an official of the European Commission's industry section, said, "In the last year, IBM has been acting as if it doesn't have anything to worry about. It is perfectly clear that the [European Economic Community] commission is the [final] antitrust body capable of taking action with regard to IBM practices, and this has strengthened our determination to get justice."

IBM argued its case before the European Commission, the civil service arm of the 10-nation European Economic Community [EEC], at a special hearing held a year ago. It tried with written and verbal evidence to dispel the notion that it dominates the market for large users, locking them into IBM products and essentially forcing them to migrate from one generation of products to another without competition.

IBM Testimony

To back up its arguments, IBM presented testimony and statements from U.S. government officials, including former Secretaries of State Alexander Haig and Cyrus Vance. Vance, a member of the IBM board of directors, told the commission that EEC sanctions against IBM could lead to the U.S. government imposing sanctions against European companies operating in the U.S.

"In the past, the United States has been criticized in Europe for an overzealous application of its antitrust laws to foreign corporations. Today, the trend is in the other direction," Vance said. "I must tell you frankly, however, that the commission's proposed action [against IBM] could bring a decided change in that trend."

Such comments seem to have had an impact opposite to their intended effect. Soon after the hearings, Frans Andriessen, the member of the European Commission with responsibility for competition policy, said that the EEC intends to pursue the case against IBM further, even if it takes years. Since then, the European Commission has been busy preparing a "Statement of Objection" updating what it considers to be IBM's malpractices and drawing up a list of proposed remedies.

"The way in which the U.S. government dropped its case against IBM and its public intervention in the European case on IBM's behalf has effectively ensured that there is no possibility of the commission dropping its case," the European Commission spokesman explained. "The U.S. government acted with incredible clumsiness. The pressure on

the commission has become so widely known that even if we wanted to give the case up, we couldn't. The whole exercise by IBM and the U.S. government has been utterly counterproductive."

EEC Treaty

IBM is accused of having committed several infringements of Article 86 of the European Economic Community Treaty. If IBM is found guilty, the commission could fine it up to 10% of the revenues accumulated in the year preceding the conclusion of the case. Based on the current revenues of IBM subsidiaries in the EEC, this means the U.S. manufactur-

er could be fined more than \$600 million.

The European Commission has basically accused IBM of two abuses. First, the commission charges, IBM has adopted a marketing policy of "bundling" certain products, particularly CPU main memory and basic software; the commission wants users to be given separate purchase options.

Secondly, when introducing product changes and additions, the industry giant refuses to disclose details of any interface change until at least after first customer shipment, if at all, according to the commission. The commission wants IBM to release in-

terface details prior to first customer shipments in such a way that they are public knowledge and so that competitors do not have to indulge in reverse engineering.

No deadline has yet been set for completing the Statement of Objections. When it is finalized, the commission will send it to IBM, which will then be given the opportunity for another hearing before the commission, most likely out of the public spotlight.

The commission will then make its decision. If the decision goes against IBM, the case will almost certainly be propelled into court soon after it is handed down.

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Critics Wary of BOC-AT&T Relationship

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Running through most of the computer industry comments filed recently on AT&T's divestiture plan is the con-

tention that AT&T's special relationship with the Bell operating companies will continue after divestiture. The chief means of maintaining it, according to the critics, is a "central staff organization," which the seven

regional holding companies are required to set up so that the U.S. Department of Defense and federal civil emergency agencies can have a single point of contact with the national telecommunications system.

The agreement settling the U.S. vs. AT&T antitrust case also says that the central organization "may" provide other functions. Critics contend, however, that AT&T's reorganization plan assigns a whole raft of functions — for example, service planning, net control, upgrading of network interfaces and transmission quality and research/engineering of Bell operating companies' product requirements — to the central staff organization. The critics also point to AT&T's admission that 75% of the

central organization's personnel will be former AT&T employees.

Perhaps the most significant critique of the central staff organization came from the Federal Communications Commission, which also filed a comment on the plan: "There is a concern . . . that the 'technical evaluation' function performed by the central staff for the [Bell operating companies] may result in the de facto promotion of Western Electric products . . . since the [Bell operating companies] are barred from the manufacture of telecommunications products . . . the argument may be made that . . . vendors in the marketplace will be a sufficient source for the research necessary to produce this equipment."

IDCMA Warns of AT&T's Power Over Divested Operating Companies

WASHINGTON, D.C. — One of the parties that contended AT&T's proposed divestiture plan gives AT&T too much power over the divested Bell operating companies is the Independent Data Communications Manufacturers Association (IDCMA), which represents major modem makers.

The IDCMA cited provisions of the plan that would leave the divested Bell operating companies "excessively dependent upon AT&T in the areas of software, patents and technical information."

IDCMA is also concerned about disclosure of technical information to competitors. "We simply can't compete unless we receive adequate and timely information about the telephone network," the association said.

Work on Their Own

ITT said the divested Bell operating companies should evaluate, select and purchase products on their own rather than through a proposed central staff organization.

IDCMA argued that, despite statements to the contrary, AT&T will participate in the deliberations of this central staff organization because two of the organization's members will be the Cincinnati Bell and Southern New England telephone companies, neither of which is to be divested.

Moreover, "the plan contains no assurance that data communications network providers will have the same type and quality of access as that provided to interexchange voice carriers," GTE Corp. said.

Access to Records

In addition, "AT&T is to have access to some of the most fundamental computerized Bell operating company customer information records, and through them could obtain ready access to . . . prospective customers for future AT&T marketing purposes, thereby obtaining an unfair competitive advantage," GTE said.

Greene should order AT&T to compensate the Bell operating companies for any investment tax benefits it obtains as a result of the reorganization, said the North American Telephone Association (Nata), an interconnect manufacturers trade group.

Nata wants installed terminal equipment transferred to AT&T at net book value rather than the lower "adjusted net book value" favored by the phone company.

The Computer & Communications Industry Association told Greene the Bell operating companies must be re-

quired to market terminal equipment through separate subsidiaries to prevent them from cross-subsidizing those offerings with revenue from their monopoly telephone service and imposing an unfair burden on the ratepayer.

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Those keys, by the way, can be redefined with your favorite commands or programs. Up to 196 unique key combinations in all.

Immediate, convenient access to your most frequently used programs.

Thanks to the HP-75's multiple-file

structure, programs, data and text can be named, simultaneously stored in memory, and programmed to interact with each other.

Add continuous memory, and you've got a computer that's designed to solve problems on the go. Simply load your favorite files and enjoy immediate access to any or all of them. The files are retained in memory until you decide to delete them—even when the machine is turned off.

Time and appointments to keep you on schedule.

The TIME key brings to display the day of the week, date and time to the nearest second.

The APPOINTMENT feature reminds you—an hour from now or a year from now—of things you have to do. You can have a silent message on the display, any one of six alarms, or a combination of both.

Even if the machine is turned off, it will "wake up" and alert you of an appointment. Or it will execute programs or control peripherals according to predetermined schedules.

In an environmental test, for instance, where readings are taken every half hour, the HP-75 can make sure its owner gets the weekend off.

Software tailored to solve your specific problems.

HP-75 software is now available in areas such as math, engineering, finance, and statistics. With VisiCalc® on the way.

Our plug-in math module*, for instance, solves polynomial roots, evaluates integrals, and performs finite Fourier transforms.

With our text-formatter module** you'll compose memos, letters, and short documents virtually anywhere; then print them out when you return to your home or office.

In addition, our third-party software program assures you of ever-expanding software variety.

If you're a volume purchaser or OEM, give us a call. We can help you create custom HP-75 systems with special plug-in modules, magnetic cards, digital cassettes, and keyboard overlays.

Peripherals for a total computing package.

The HP-75 is equipped with the Hewlett-Packard Interface Loop, giving you a choice of 15 peripherals. (And that choice is expanding. The HP-75 can work simultaneously with up to 30.)

In a battery-powered briefcase system weighing about seven pounds, you might have the 24-character printer, digital cassette drive and acoustic modem***.

A desktop system might include the 80-column impact printer, full-color graphics plotter, and 12-inch video monitor.

And the HP-75 can "talk to" other computers, peripherals, and instruments with our HP-IB (IEEE-488)*** RS-232C*** and

GPIB interfaces.

In summary, the HP-75 is the heart of an extremely versatile system, in addition to its stand-alone capabilities.



Manuals to make sure you get the most from your machine.

Chock-full of examples and helpful hints, our owner's manual will get you up and running in short order. And it's organized to help you access the information you need to get on with the job at hand.

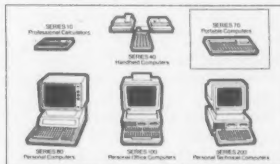
A supplementary reference guide provides a concise summary of the computer's operating protocol and instruction set.

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**HEWLETT
PACKARD**

Adapso Prods Greene to Alter AT&T Judgment

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Long-distance data communications users may get better service from AT&T than from its competitors unless the telephone company's proposed divestiture plan is changed, the Association of Data Processing Service Organizations, Inc. (Adapso) contended earlier this month.

Adapso was one of several interested parties that told U.S. District Court Judge Harold H. Greene what they think of the divestiture plan that AT&T devised recently to carry out the antitrust settlement it negotiated with the U.S. Justice Department last year. Greene presided at the trial and is overseeing imple-

mentation of the agreement.

AT&T and the Justice Department will have a chance to respond to the comments filed this month. Replies to AT&T and Justice comments are due April 10 from the parties that filed earlier this month.

Greene will then decide whether to accept, reject or modify the phone company's plan. It is not known how long he will take to make that decision.

Adapso Arguments

In the comments it filed with Greene, Adapso argued that although the settlement agreement — officially known as the Modified Final Judgment — requires all of the 22 to-be-divested Bell operating compa-

nies to provide equal "information access" as well as equal "exchange access," AT&T's plan talks almost exclusively about the latter. AT&T will share many switching facilities with the operating companies, Adapso said, pointing out that the phone company also will retain exclusive ownership of the software that runs the Stored Program Control switches now being installed in the network.

Adapso's key point was that this arrangement would enable customers of AT&T's unregulated subsidiary, American Bell, Inc., to obtain better service from AT&T's Long Lines Division than customers using the services of competing suppliers.

This problem "is by no means hypothetical," the association contend-

ed, referring to statements made by the Federal Communications Commission (FCC) last summer when it ruled on the application for what is now called Basic Packet Switching Service (BPSS). The application was rejected partly because American Bell planned to place the packetizing/depacketizing facilities for its projected Advanced Information Service/Net 1000 (AIS/Net 1000) service alongside Long Lines' BPSS switches. Because American Bell's competitors would not be allowed to do likewise, the FCC said this could mean that AIS/Net 1000 customers would not only pay lower rates, but also reap some technical advantages.

"Access to the total range of frequencies occupied by a particular intercity carrier system can be obtained from many central offices; this can be of particular value where high-speed data transmission over analog carrier facilities is required," the commission explained, adding that American Bell's competitors would need "special construction of local connecting facilities" to provide equivalent access to their customers.

"A similar question may arise if information access is provided by the [Bell operating companies] through facilities designed by and jointly used with AT&T," Adapso said this month in its comment on the divestiture plan. "The problem would be particularly acute ... if the [operating companies] are not given control of the software used in their switching facilities."

Cbema's Concerns

The Computer and Business Equipment Manufacturers Association (Cbema), after pointing out that its members "are substantial users of AT&T and [Bell operating company] communications facilities," said that as users they are concerned about two aspects of the divestiture plan: the possibility that local exchange access charges may be hiked to cover revenue shortfalls stemming from the divestiture, which would raise rates to end users; and the plan's alleged failure to identify clearly who will own certain backbone communications links.

On the first point, Cbema referred to the affidavits given to Greene by the chief executive officers of the seven regional holding companies created by the divestiture plan. In these affidavits, the officers promised that their companies would be financially viable after being separated from AT&T. Cbema is worried about these affidavits because several were predicated on an assumption that local regulatory bodies would raise access charges to cover divestiture-induced revenue shortfalls.

On the second point, Cbema noted that the divestiture plan allows AT&T to own circuit links totally within an operating company's territory, officially known as a Local Access and Transport Area (Lata), if those circuits "perform inter-Lata functions." The capacity of these links would then be leased to the operating companies.

This scheme leaves end users uncertain about how such facilities will be priced and who will service them, Cbema indicated.

HP-75 SPECIFICATIONS

Size and weight: 10" X 5" X 1 1/4"; 26 oz.

48K-byte, ROM-based operating system:

- 8-bit CMOS CPU • Multiple file structure in continuous memory • Instruction set: 52 system commands, 43 BASIC commands, 41 numeric functions, 7 string functions, 6 time-mode commands, 16 arithmetic/logical/relational operators

Numeric precision:

- Real—12 digits (±9.999999999999 x 10⁻⁴⁹⁹)
- Short—5 digits (±9.9999 x 10⁻⁹⁹)
- Integer—5 digits (±99999)

Time/appointments:

- Perpetual clock/calendar • 12- or 24-hour format • Appointment control of command/program execution

Memory:

- User (RAM)—16K bytes, expandable to 24K bytes • Operating system (ROM)—16K bytes (32K-byte modules)

Transmitter-like QWERTY keyboard:

- 65 keys • 194 redefinable key combinations

• "Hidden" numeric keypad

Integral mass storage: hand-pulled card reader (1,312 bytes per card) • HP-IL choice of 15 peripherals

Power supply: 3 AA NiCad batteries (AC adapter (charger) included)

Liquid-crystal display: 32-character window

P602304 282 E

Compatibility at Issue in Cobol-80 Controversy

(Continued from Page 1)

providing full conversion support, a fact that makes the standard more of a risk than they are willing to take.

"If I have to give heartburn to a compiler writer or a consumer, I'll give it to the compiler writer," said Art Dubnow, chairman of the DPMA's standards committee. Dubnow estimated that recoding accounts for only about 10% of the cost of converting and he recommended that the benefits of Cobol-80 be "fractured, so that the benefits are optional when compiled."

Changes Cited In Cobol-80

HARTFORD, Conn. — The proposed Cobol-80 standard developed by the American National Standards Institute X3J4 subcommittee contains major structural improvements, said Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc., a training consultancy firm, and a member of the X3J4 and X3 Codasyl committees.

Speaking at a panel discussion of the new standard proposal held here recently, Garfunkel pointed to some specific changes that he said clean up ambiguities and eliminate obsolete code:

- Some 20 conditional statements have scope terminators attached to them.
- A new EVALUATE verb can apply to multiple variables at once in any mix.
- The new version nests programs inside each other, making global data available to internal programs and allowing the user to specify global declaratives.
- Data values within programs can be initialized by adding simple statements.
- CALL statements have been changed to add a feature that allows the user to pass data between programs for manipulation with or without altering the original values.
- DO WHILE and DO UNTIL variations of the PERFORM verb have been incorporated to allow testing before or after execution.
- Subscript limits have been extended to a minimum of seven levels.
- FILLER has been made an optional word that now can be specified at the group level.
- A de-editing feature has been added, allowing a numeric edited data item (for example, TIC CZ) to be moved into purely a numeric data item (for example, TIC 99).
- A symbolic character clause allows programmers to define a character and equate it with Ascii characters that previously were nonprintable.
- A WITH DUPLICATES clause has been added to the SORT verb to ensure the input sequence of duplicate keys will be returned to the output file in sequence.
- The INSPECT statement has a new CONVERTING clause option that offers a shorthand mechanism for doing multiple replacements of characters.

But figures will bear out the worth of converting to the new standard, countered Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc., a training consultancy firm and a member of the X3J4 and X3 Codasyl committees.

Garfunkel, the panel's lone conversion advocate, said a forthcoming document from the National Bureau of Standards will show that the cost benefits of converting to the new standard outweigh the drawbacks by about six to one. The report will be available in late spring from the National Bureau of Standards, Room A265, Building 225, Washington, D.C. 20234.

Garfunkel also maintained that the compatibility issue will ease if

vendors provide assurance to customers that conversion aids will be available. "X3J4 ought to legislate that," he said.

The DPMA recently withdrew its strident objections to the proposed standard [CW, Jan. 10], indicating that Cobol-80 deserved another look. And opposition from the panel to the proposed changes was noticeably absent — a reflection, panelists said, of extensive revisions made by the X3J4 committee after more than 2,200 negative responses were received during initial public review last spring. None of the panelists questioned that the revised standard is clearly an improvement over Cobol 74. How much of an improvement was the point of contention.

Garfunkel ardently restated the theme that time is of the essence in adopting a standard. "The world is getting smaller and [systems] will need to talk to each other a lot better. Standards make that happen," he maintained.

"All the controversy about compatibility foreshadows the fact that Cobol-80 has a lot of neat stuff that makes it more productive and easier to use," he claimed. "I don't want to [downplay] incompatibility, but I don't want to confuse it with the clear definition given to things that were undefined before."

The panel was moderated by Lemuel Skidmore of New England Data Services, also an X3J4 committee member.

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Student Opinion Form

Course Name: _____
Course Number: _____
Course Ending Date: _____
Training Center: _____

This Student Opinion Form is designed to help Digital assure the quality and usefulness of its training courses. Please respond carefully and objectively as indicated below.

- Complete the course information above. Do not write your name anywhere on this sheet.
- The other side of this sheet consists of two sections: **Background Information** and **Evaluation of Course**. In the **Evaluation of Course** section you will find a list of numbered statements that may or may not describe your opinions about this course. Please indicate whether you agree or disagree with each statement by selecting the appropriate lettered box from the following choices:

SA = Strongly Agree A = Agree U = Uncertain D = Disagree SD = Strongly Disagree NA = Not Applicable

PLEASE READ DIRECTIONS ON THE OTHER SIDE. SELECT THE ONE BEST ANSWER.

BACKGROUND INFORMATION

- What is your relationship with Digital? (a) customer (b) employee (c) other a b c
- What is your primary job area? (a) hardware (b) software (c) management (d) education (e) other a b c d e
- How many years of experience have you had with computers? (a) less than 1 (b) 1-3 (c) 4-6 (d) 7-9 (e) 10 or more a b c d e
- Did you meet all the stated prerequisites? (a) Yes (b) No a b
- Why did you take this course? (a) general interest (b) required for current job (c) required for new job (d) to help get new position a b c d
- What is your native language? (a) English (b) Spanish (c) French (d) German (e) Italian (f) Japanese (g) Chinese (h) Dutch (i) Swedish (j) Other a b c d e f g h i j

EVALUATION OF COURSE

STATEMENT	SA	A	U	D	SD	NA
1. I learned a lot of valuable skills and information.	1 SA	A	U	D	SD	NA
2. The course content met my expectations.	2 SA	A	U	D	SD	NA
3. The course was well organized.	3 SA	A	U	D	SD	NA
4. The course materials were easy to understand.	4 SA	A	U	D	SD	NA
5. I needed all the information contained in the course materials.	5 SA	A	U	D	SD	NA
6. The course emphasized the real job.	6 SA	A	U	D	SD	NA
7. My test scores accurately reflected what I learned.	7 SA	A	U	D	SD	NA
8. The lab exercises were useful for learning.	8 SA	A	U	D	SD	NA
9. The instructor was very knowledgeable in the subject.	9 SA	A	U	D	SD	NA
10. The instructor answered difficult questions easily.	10 SA	A	U	D	SD	NA
11. The instructor's presentations were easy to understand.	11 SA	A	U	D	SD	NA
12. The instructor made the course interesting.	12 SA	A	U	D	SD	NA
13. The instructor managed class discussions well.	13 SA	A	U	D	SD	NA
14. The instructor took the time to answer questions.	14 SA	A	U	D	SD	NA
15. The instructor was patient and helpful.	15 SA	A	U	D	SD	NA
16. The instructor emphasized the objectives of the course.	16 SA	A	U	D	SD	NA
17. The instructor made effective use of the available time.	17 SA	A	U	D	SD	NA
18. The training center provided all the services I needed.	18 SA	A	U	D	SD	NA
19. My workspace in the classroom was comfortable.	19 SA	A	U	D	SD	NA
20. The classroom was well laid out.	20 SA	A	U	D	SD	NA
21. The lab was functionally laid out.	21 SA	A	U	D	SD	NA
22. The lab time was adequate for this course.	22 SA	A	U	D	SD	NA
23. My housing was satisfactory.	23 SA	A	U	D	SD	NA
24. Please indicate your overall impression of this training experience.						

E=Excellent VG=Very Good G=Good F=Fair P=Poor

Martin and Bell Labs Director To Speak at Federal Expo

WASHINGTON, D.C. — James Martin, author of more than 25 books on computer/communications technology, will be the featured speaker at the Federal Office Systems Expo (Fose '83), to be held here March 14-17.

The keynote address will be delivered by Joseph LaFerrera Jr., executive director of Bell Laboratories. LaFerrera will address "The Manager in the Information Age: Participant or Spectator?"

Other sessions at the conference include a discussion of local-area networks by Neal Dempsey, vice-president of marketing at Harris Corp.; "Beyond Word Pro-

cessing: Office Systems Integration," by Dr. Jay Kunin of Hammer & Co.; "The Professional as a User of the Office System," by Peter Brunner of the U.S. Department of Labor and Leland Russell of Eiger Corp.; and "Alternate Worksites," by Richard Harkness, senior strategic planner at Satellite Business Systems.

The registration fee for the full conference is \$250, according to a spokesman.

More information is available from the show's sponsor, National Trade Productions, Inc., which is located at 9418 Annapolis Road, Lanham, Md. 20706.

Grid Systems Introduces Programs to Link Compass With IBM CPUs, DEC VAX

By Ed Scannell

CW Staff

MOUNTAIN VIEW, Calif. — Grid Systems Corp. has introduced terminal emulation programs that allow its Compass portable computer to communicate interactively with programs running on IBM's 370, 30 series and 3080 series mainframes as well as all Digital Equipment Corp. VAX-11 superminis.

The Grid3101 program reportedly turns Compass into either a 3101 or 3270 portable terminal that permits either character- or block-mode com-

munications with IBM mainframes. GridVT100 software permits the Grid computer to access and retrieve data from the DEC superminis by emulating the DEC VT100 terminal.

Besides the emulation packages Grid made three other announcements including:

- Its support of IBM's MS-DOS operating system for the Compass Computer.

- Two Compass-compatible local disk storage devices: the M2101, a combination 5¼-in. Winchester and floppy diskette drive; and the M2103, a portable 5¼-in. floppy diskette drive.

- And Gridprint, a document formatting software package that enables Compass users to format documents more easily to be printed on the vendor's dot matrix printer.

In addition to emulating the IBM and DEC terminals, Compass users reportedly can also configure the emulation programs to emulate any other nonintelligent asynchronous terminal, giving the system access to private and public data bases as well as remote computer systems.

According to Grid President David Hanna the emulation programs supply solutions to two different management needs. "The first [solution] is for the end-user manager who needs a management workstation capability and wants a system that links to the mainframe or minicomputer.

"The second [solution] is for the [management information systems] director or data processing manager of any large organization who faces a proliferation of incompatible 8-bit and 16-bit systems that can't be linked or interleaved into the corporation's large computer systems and data bases," he explained.

Supporting the Grid3101 emulator is Gridreformat, which reformats data retrieved from a host file and sends it to a Compass file. In doing this, the reformatted data is then compatible with other Grid management application packages.

Other IBM mainframe data and capabilities Compass users can access through the packages include:

- IMS and CICS applications and files for processing and data manipulation.

- Development systems such as VM/370 or TSO/SPF for text processing, file manipulation, job submission and program development.

- Access to time-sharing systems including The Source, Dow Jones and Compuserve.

The Grid3101 and the GridVT100 emulation packages cost \$200 each. Gridreformat, which supports Grid3101, sells for \$100.

The one-time cost for the MS-DOS operating system is \$150. Prices for the disk drives are \$4,100 for the M2101 combination hard/floppy disk drive and \$1,195 for the M2103 portable floppy disk drive. Gridprint costs \$75.

More information can be obtained from 2535 Garcia Ave., Mountain View, Calif. 94043.

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Execs Define Role of Info Resource Manager

By Jim Bartimo

CW Staff

PHILADELPHIA — "Is information resource management more than just a buzzword?"

Posed by Verne Morland, strategic planner for NCR Corp., that question was answered by a handful of experts who also defined the role of the information resource manager at the Office Automation Conference (OAC '83) held here last week by the American Federation of Information Processing Societies, Inc.

The information resource manager's role is basically to manage the ways and means by which end users can access company data, said Alexia Martin, management systems consultant at SRI International, Inc. But,

**CW
At OAC '83**

she noted, this means the information resource manager must oversee business system methodologies, information requirements, data dictionary and information center.

He will also research present and future corporate information requirements, serve as the repository of corporate information and create policy guidelines and procedures appropriate to the support of company goals and objectives.

The long-term goal of the information resource manager is to sup-

port better management decision making, reduce the cost of information acquisition and allow the company to share resources, Martin said.

As an information resource manager, Morland applied these points to the example of personal computers. "Personal computers are being bought now and thought about later," Morland said. "Managers have not taken a managerial role because they have been intimidated by the technology."

The information resource manager is better equipped to deal with this type of problem because he is familiar with the technology, Morland said.

But the information resource manager will encounter some problems

as he tries to restrict certain means of data access. "The restructuring of information will meet with the same reception as the restructuring of the budget," Morland said. "The information resource manager will be viewed as a power broker and an empire builder because whoever controls the distribution of information controls the distribution of power."

This problem can be circumvented by pointing out to users that information, unlike another source of power — money — can be used by more than one person and can be used differently by different people, Morland said. "The information resource manager is really only concerned with data about data, not the data itself," he added, pointing out that a data dictionary only tells the user where the data resides, not what the data means.

Tom Elder, systems development manager for Frito Lay, has a staff of six providing technical information to his company for the past year. The resource center provides application consulting, education and other assistance, Elder said.

HP, DG Ink PBX Agreements

(Continued from Page 1)

their products to let Northern Telecom's Displayphone function as a workstation in a CEO office systems network. A date for actual compatibility will be set within the next two or three months, a spokesman said.

On the product side, Exxon Office Systems Corp. was a primary newsmaker when it announced its 8400 series of shared resource workstations and the Model 965 ink jet printer. The Unix-based 8400 system employs multiple 16-bit Zilog, Inc. Z8000 microprocessors and features three models ranging in storage capacity from 512K bytes of main memory and 14.5M bytes of hard disk storage to 2M bytes of main memory and 306M bytes of disk storage.

The 8400 series is built on the Exon 500 series information processor. The Model 520 functions as the 8400 systems terminal; current 520 users need only a simple field upgrade to access the multiuser capabilities of the 8400. The 500 series models link to the 8400 controller via multidrop, twisted-pair wiring.

A three-workstation, one-printer system costs \$27,500 from Exxon at 777 Long Ridge Road, Stamford, Conn. 06902.

Wang Laboratories, Inc. announced enhancements to its Digital Voice Exchange (DVX) voice store-and-forward system, including the DVX Option, which provides full voice capability when attached to a Wang OIS 145, and word processing capabilities on the DVX. It announced a message management system that allows anyone to deposit voice messages for DVX subscribers.

The DVX Option supports up to 250 users, will be available in May and costs \$54,000. The DVX with word processing is available immediately in 12 different models ranging from \$119,000 to \$248,300.

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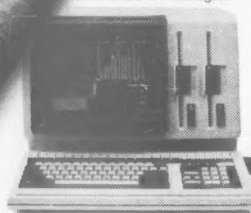
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DEC Leads Off OAC Software Product Debuts

PHILADELPHIA — Among the software products introduced at the Office Automation Conference (OAC '83) here last week was the All-in-One Graphics program, a menu-driven graphics package unveiled by Digital Equipment Corp. for its VAX-11 line of superminis.

All-in-One includes four separately priced products:

- VAX-11-Decgraph, a tool for generating charts and graphs needed for ad hoc decision-support-type reports. It carries a license fee of \$3,500 and will be available in June.

- VAX-11-Decslide, designed to generate presentation graphics in the form of slides and transparencies that can include both graphics and text. Available in September, it is licensed for \$3,500.

- Polygraphics, a product for creation of documents that can combine graphics and text on a page. It can be licensed for \$6,000.

- Fingraph, a third-party product available from Fingraph Corp. through DEC's Classified Software program. DEC will be marketing the product, which is intended to provide more sophisticated management reports by converting large amounts of tabular data into graphics format and reports.

The license fee for Fingraph begins at \$5,000, depending on the configuration. This fee does not include support, which is available through Fingraph Corp.

The All-in-One package is available with an optional "satisfaction guaranteed" program. Interested customers work with DEC representatives on a consulting basis to develop a customer support plan for the product.

If they are not satisfied with the product during the first four months after its installation, their hardware purchase price and software license fees will be refunded, a DEC spokesman explained.

DEC also announced at the show a version of its Dectype word processing system for the VAX-11 supermini. The VAX-11 version is licensed at \$5,000. (The current PDP-11 version is licensed at \$3,500.)

In addition, an agreement with Houghton Mifflin Co. was outlined regarding the upcoming availability of that firm's spelling correction and

DPI Meet to Focus On Resource Use

OTTAWA — "Maximizing Resources in Times of Restraint" will be the theme of the Data Processing Institute's (DPI) Professional Development Week conference here March 15-17.

Topics to be addressed include corporate information strategy, office communications, information management, computer-assisted learning and software tools.

Running concurrently will be Interchange '83, an exhibition of DP systems from various Canadian government agencies, which will be free and open to the public.

For DPI members the conference will cost \$40, for nonmembers \$70 and for students \$20. DPI can be reached through Box 2458, Station D, Ottawa, Ont., Canada K1P 5W6.

verification package for the VAX-11.

Further information on DEC's announcements can be obtained from the firm at 129 Parker St., Maynard, Mass. 01754.

In addition to working with Northern Telecom on interconnecting its Comprehensive Electronic Office (CEO) system workstations to the SL/1 (story on Page 1), Data General Corp. announced a software package that makes Wang Laboratories, Inc. word processing systems compatible with CEO systems. The CEO Document Exchange package allows documents received on either CEO or Wang systems to be edited, filed or mailed as if they were produced on that system.

The initial license fee for the pack-

CW At OAC '83

age is \$5,000. Subsequent licenses are \$2,500. DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

Also unveiled at the show was a new release of On-Line Software International, Inc.'s Omnicom electronic mail system. Omnicom Release 3 reportedly enables messages to be addressed with actual names rather than user identification numbers to make it easier for nontechnical employees to learn the system.

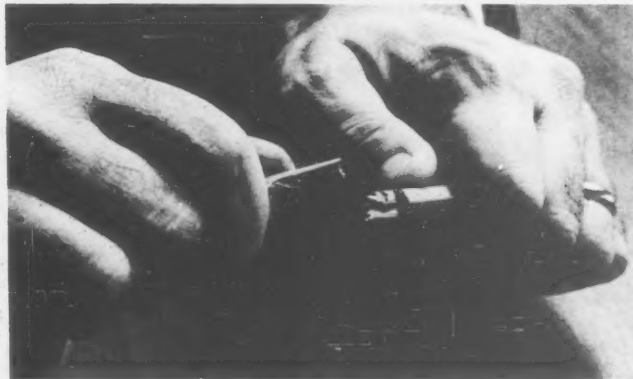
The enhanced system also offers the setup of private or company-

wide distribution lists on-line. The vendor explained that the user itemizes the list and gives it a name. When sending a message to a group, the user addresses it to the distribution list name and the correspondence automatically is delivered to everyone on the list.

Compatible with any single CPU or multiple-CPU network running IBM's CICS, Omnicom is reportedly no longer dependent on a CICS sign-on. It now includes its own sign-on, which requires only mailbox name and password.

Pricing for Omnicom Release 3 begins at \$25,000, the vendor said from On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

ARE YOUR INFORMATION SYSTEMS INVALUABLE MANAGEMENT TOOLS OR A CONSTANT SOURCE OF AGGRAVATION?



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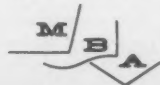
These are challenging times. Like it or not, Information Systems are a determining factor on how well your company performs. But how can your company hope to successfully compete if your management doesn't apply the same type of organization and technology to your Systems Development efforts, that you recommend for other parts of your company? This is why we created the PRIDE-Automated Systems Design Methodology (ASDM).

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Wang Chief Sees Today's Micros Obsolete by '90

By Bruce Hoard
CW Staff

PHILADELPHIA — Many of today's stand-alone microcomputers will be obsolete by 1990, the president of Wang Laboratories, Inc. said here last week at the Office Automation Conference (OAC '83), sponsored by the American Federation of Information Processing Societies, Inc. John Cunningham attributed the approaching obsolescence of stand-alone personal computers to a growing need for multifunction workstations by professional managers.

"The craze for [personal computers] has caused a bottom-up approach to their usage, rather than a top-down approach that would fit [personal computers] into larger business

CW At OAC '83

goals," Cunningham declared.

The low cost of personal computers has led many users to buy first and think later about how to use them, he added. While admitting personal computers offer benefits, he said the value of some of their applications is overrated.

Current stand-alone personal computers will be obsolete by 1990 because as more attention is given to the professional and the manager it will be recognized that they need a multifunction workstation more

than a personal computer, he claimed. "In other words, users need a definite set of applications," Cunningham said. "As office automation gains ground with professionals and managers, many of today's stand-alone [personal computers] will turn out to be a shortsighted investment."

When implemented without proper planning, stand-alone personal computers end up with no resource sharing, communications or networking capabilities or upgradability to the "advanced functions that characterize office automation."

The continued growth of personal productivity systems for workers at all levels of the office may be endangered by unwise investments and lingering disappointments in today's



CW Photo by J. Bartino

John Cunningham

personal computer, Cunningham said.

The multifunction workstation will supersede the stand-alone micro, he claimed. Eventually, professional, managerial and administrative and secretarial workstations will perform all the basic tasks for which they were acquired. Multifunction workstations will also be able to communicate, handle electronic mail, access internal and external data bases and do graphics and word processing, he declared.

Cunningham said office automation is a "five-year-old who has learned several important early lessons." Its growth could be stunted if technology is implemented with faulty expectations and if people close their minds to new ideas about productivity and cost justification, he added.

Cunningham warned against office automation cost justification based solely on quantifiable measures. He said it is the quality and effectiveness of a memo's content or the timing of a telephone call that are "ultimately" important.

"The true function of office automation is to enhance the performance of a cooperative office team by helping it to achieve the overall business goals of an organization," Cunningham commented.

Seminar to Cover Selling Software

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (DPMA) is sponsoring a seminar on "Developing the Software Design and Technical Management Sections in the New Business Proposal." It will be given March 14-15 in Orlando, Fla.; March 17-18 in Washington, D.C.; and April 7-8 in Boston.

The seminar offers a plan for organizing software proposal teams, selling customers on your company's capabilities and demonstrating requirements understanding, translating requirements into design and managing the software development activity. The tools necessary for developing the winning software proposal will also be presented.

The registration fee is \$445 for DPMA members and \$475 for others. More information is available from DPMA Seminars, Department SPP, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

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Your Survival Depends On In-House Systems, Speakers Tell Bankers

By Jeffrey Beeler

CW West Coast Bureau
PALM SPRINGS, Calif. —

The very survival of large banks and other financial institutions will hinge, to a great extent, on their in-house systems departments and the applications those organizations create.

That observation was one of the main conclusions that emerged earlier this month during a two-day conference attended by 50 senior executives of financial institutions throughout the U.S. The conference was sponsored by Dallas-based Hogan Systems, Inc., a supplier of integrated application software for banks and related businesses.

Faced with the threat of unprecedented competition, financial institutions are finding themselves under increasing pressure to automate their tried and true methods of delivering customer services, IBM consultant Don Long said in an address delivered at the conference.

Most of those delivery mechanisms are cumbersome and woefully ill-equipped to compete in a world where electronic banking is fast becoming a way of financial life, Long pointed out.

The responsibility for improving the efficiency of bank customer services falls squarely on the shoulders of systems personnel, who are being called upon to develop much of the application software upon which electronic banking depends. So, like it or not, computing specialists within large financial institutions are rapidly assuming a newfound importance, Long said.

Caught Off Guard

This abrupt rise to prominence has probably caught most of the banking industry's DP staff members at least a little off guard.

Until recently, information systems departments and other bank back-office groups were regarded primarily as "garbage collectors," the entities that "clean up the messes" in their respective institutions, Long explained.

But today, for the first time, computing shops and other operations departments within large financial institutions are becoming directly involved in the creation and distribution of new customer services.

Long, who works primarily with large financial institutions, attributed the banking businesses' growing investment in automated ser-

vices to increased competition, from both within and without the industry.

Part of the intensified competition is coming from brokerage houses, major retail store chains and other companies that banks never before regarded as serious rivals. These so-called "near banks" have recognized the banking industry as a major new business opportunity for the future and are rapidly repositioning themselves to take advantage of that opportunity.

Competition Among Banks

Competition is also growing quickly among the existing banks themselves — a fact Hogan Systems President Richard Streller ascribed to the banking industry's recent deregulation. In the wake of changes in federal banking rules, financial institutions can now pay whatever interest rate they choose for their depositors' checking accounts, Streller said in an interview during the conference.

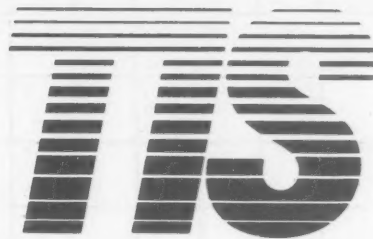
Whatever the source of the banking community's increased competition, one fact remains beyond serious dispute: Financial institutions now need to improve the efficiency of the mechanisms through which they deliver their customer services, although automation should proceed slowly, Long said.

"Changes are necessary in the way banks make their services available to their customers, and the sooner those improvements come, the better," he warned. "Banks that neglect to make the required adjustments will find themselves falling behind their competitors and may even have a hard time staying in business," he said.

At present, the vehicles on which banks and other financial institutions rely to deliver services to their customers are outmoded and extremely inefficient, Long said. In 1980, for example, U.S. financial institutions processed 50 billion checks and other pieces of paper and spent \$24 billion on labor. The "near banks," by contrast, boast a comparatively efficient service-delivery mechanism, although they are still unable to offer customers the same level of convenience as the more established institutions.

So for existing banks to keep pace with their new sources of outside competition, they "have to replace human tellers with electronic ones and install automated systems instead of paper-based services," Long said.

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Baltimore	April 5	Green Bay	March 16	Orlando	April 13
Boston	March 10	Hartford	March 9	Philadelphia	March 15
Charlotte	April 14	Houston	March 1	Phoenix	April 7
Chicago	March 15	Indianapolis	March 16	Pittsburgh	March 16
Chicago	April 29	Irvine	April 6	Richmond	April 6
Cincinnati	April 12	Kansas City	April 27	Rochester	April 7
Cleveland	March 17	Los Angeles	April 5	St. Louis	April 28
Columbus	April 14	Madison	March 22	St. Paul	April 5
Dallas	March 3	Memphis	March 9	San Francisco	April 28
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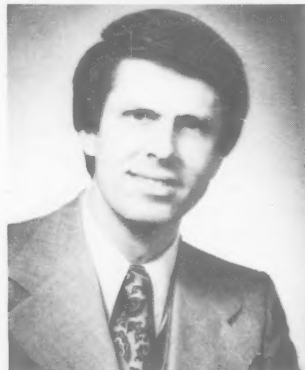
Managers on the Move

S. ROBERT DiRAFFAELE has been appointed vice-president of corporate systems and methods for Crum & Forster Corp. in Morristown, N.J. He previously served as assistant vice-president, systems and programming.

Before joining Crum & Forster in



S. Robert DiRaffaele



Russell J. DuRoss

1981, DiRaffaele began his career with Great American Insurance Co., where he served in various underwriting and data processing positions over a period of 15 years.

DiRaffaele earned a B.A. degree from Brooklyn College.

RUSSELL J. DuROSS was recently named director of information services/accounting for Detroit-based Fruehauf Corp., a supplier of equipment and services for the truck-trailer, automotive, maritime and aerospace industries.

DuRoss will direct the development of information systems in conjunction with Fruehauf Division's accounting activities.

DuRoss, who has been with Fruehauf five years, most recently served the corporation's management information systems department as branch systems manager. He also served as financial systems manager and data base administrator.

DuRoss holds both an M.S. degree in computer science and a B.A. in mathematics from Wayne State Uni-



Roderic Butler

versity, Detroit.

RODERIC BUTLER has been appointed director of management information systems for Nuodex, Inc., located in Piscataway, N.J. Nuodex is a manufacturer of coating chemicals and colorants, specialty chemicals, synthetic lubricants and rigid vinyl products.

Prior to joining Nuodex, Butler served Tenneco Chemicals, Inc. as data center manager, a position he held since 1981. Before that he was a computer system consultant to Blue Cross of New Jersey.

Butler holds a B.S. degree in aeronautical engineering from St. Louis University and an M.S. in mathematics from New York University.

M. DOUGLAS MAY has joined the Finance Department as director of management information services for Hardee's Food Systems, Inc. in Rocky Mount, N.C. May will be responsible for the management information systems function for Fast Food Merchandiser, Inc., Hardee's manufacturing and distribution subsidiary.

Formerly director of information systems at Burger Chef, May also held positions in the data processing department of Westinghouse-Nuclear Fuel Division in Pittsburgh, Pa., and Hamilton Cosco in Columbus, Ind.

May earned a B.S. in industrial management from Purdue University in 1967.

QAI Meet Set For MIS Heads

ORLANDO, Fla. — The Quality Assurance Institute (QAI) will sponsor a March 7-8 workshop directed at management information systems directors. The workshop will be held at the Dutch Inn here.

The two-day workshop, designed to help managers develop a DP quality plan of action for their organizations, will stress strategies for improving the quality, productivity and credibility of DP activities.

The workshop fee is \$495, which includes a manager's library of materials.

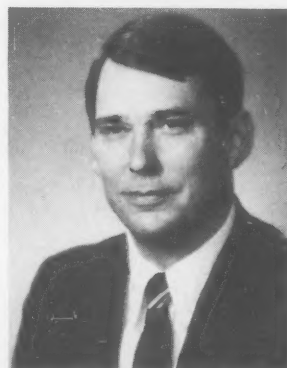
More information is available from QAI, located at 9222 Bay Point Drive, Orlando, Fla.

VCI User Workshop Slated for April 24

CHERRY HILL, N.J. — Value Computing, Inc. (VCI) has announced that its 10th annual user workshop will be held April 24-27 at Chicago's Hyatt Regency Hotel.

In addition to tutorials on VCI products and user case histories, Workshop '83 will feature a keynote speech, "The Mini Meets the Mainframe," by Werner L. Frank, head of the WL Frank Computer Group and former executive vice-president of Informatics, Inc.

There is no registration fee for VCI users; nonusers will be charged \$300. More information is available from VCI, located at 498 N. Kings Highway, Cherry Hill, N.J. 08034.



M. Douglas May

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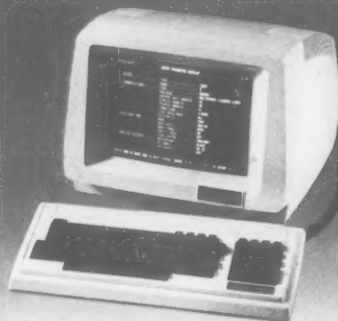
This separate piece of hardware connects between modem and telephone line. The SAU also:

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DP Auditing a Yellow Brick Road?

Q I am a DP audit manager at a large diversified company. I have eight years in programming and operations and six years in DP auditing. Although my salary has increased dramatically over the last six years, I am becoming increasingly disenchanted with DP auditing as a profession.

I thought that DP auditing would be the Yellow Brick Road to an upper management position. I do not think so anymore. DP professionals consider DP auditors to be accountants, and financial/accounting people consider us to be DP professionals. Some questions:

1. Do you consider DP auditing a good career path?
2. How long should one stay in DP auditing?
3. How difficult would it be for me to get back into DP?
4. Where do you think I should go from here?

A 1. Yes.
2. Until it ceases to be economically and personally gratifying.

3. For you, easy. Try quality assurance, systems analysis or management.

4. To another company which offers greater opportunity.

Information systems auditing is a relatively new discipline whose function is not well understood. This lack of understanding impedes lateral and upward mobility. As a manager, you should take it upon yourself to create an awareness of the information systems auditing function, then promote the positive aspects (and there are many) of greater internal mobility for yourself and your colleagues. Opportunity will follow.

Q The salary levels of my programmer/analyst colleagues are below those of the local area, especially for experienced people. Dissatisfaction with the most recent "increases" added fuel to the fire.

Over the last few years we have been approached several times by union organizers, but have never met to discuss the possibility of unionization. Now, however, people like myself, who had never given unions a second thought, are beginning to talk union.

We would be interested in your opinion on the long-term effects of unionization in a DP shop.

A Programmers and systems analysts are professionals. The performance standard for a professional is pride. Performance is not adequately rewarded in a union environment. Productivity suffers and innovation is dampened.

You obviously have some problems that need immediate attention, but I doubt that unionization is the solution. As amazing as it may sound, I'm aware of several companies whose management information systems (MIS) compensation package is based on erroneous data.

If management is not receptive to working toward salary parity, then I would exercise a professional's prerogative and leave.

Q Last year I graduated from college and joined my father's business, presumably to sell appliances. I convinced him to buy a computer and have since automated all the company's accounting and inventory systems.

I now spend almost all my time programming or operating the systems. I enjoy my work and would like to be able to discuss it with others, but I'm a one-man show.

Association for Computing Machinery and Data Processing Management Association chapters are located nearby. I would like to join one so that I can talk with people of similar interests. Which one do you think would be best for a person in my position?

A The decision to join one or the other should be based on whether you like the people and the quality and orientation of the chapter activities. Chapters of the same society vary considerably from one city to the next.

I would suggest that you visit each several times. Pay particular attention to the makeup of the active membership.

One group sometimes becomes the dominant force and ultimately determines the type of programs scheduled. The best chapters have a healthy cross section of managers, academics, programmers, analysts, hobbyists and vendors.

I would also be remiss not to mention that there are scores of other so-

Turnaround Time By Larry E. Long



cieties for MIS professionals, many of which have been listed here.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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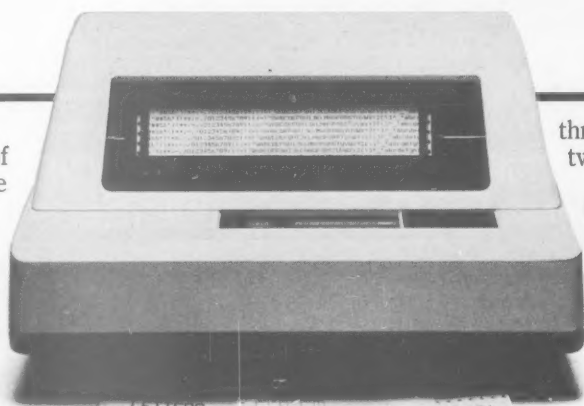
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three convenient built-in interfaces: two parallel and one serial.

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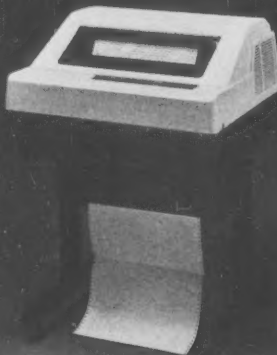
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Week of March 6

March 9-11, San Francisco — **Minicomputer Systems: Guidelines for Successful Selections.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Week of March 13

March 14-16, Houston — **IMS/VS Message Format Services.** Contact: Data Base Management, Inc., 1075 Tolland Tnkp., Manchester, Conn. 06040.

March 14-16, New York —

Structured Testing: Tools and Techniques. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, New York — **Practical Data Security: Implementation and Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, San Francis-

co — **Telecommunications Management: Cost Reduction Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, San Francisco — **Office Automation: Concepts, Systems and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J.

08075.

March 14-16, Chicago — **Office Automation: Strategic Planning.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-16, Chicago — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J.

08075.

March 14-16, Washington, D.C. — **DP Operations Today: Effective Scheduling and Console Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

March 14-18, Houston — **CICS/VS Command Level Programming.** Contact: Data Base Management, Inc., 1075 Tolland Tnkp., Manchester, Conn. 06040.

March 15-18, Boston — **Microprocessor Software, Hardware & Interfacing.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Washington, D.C. — **Computer Graphics.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Boston — **Local-Area Networks: Practical Configuration Techniques.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, San Diego — **Distributed Processing: Mini and Microcomputer Implementations.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Los Angeles — **Defining Software Requirements, Specifications and Tests.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

March 15-18, Los Angeles — **Hands-On Unix Workshop.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

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Calendar

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EDITORIAL

A 'Big Stick' Policy?

Remember Teddy Roosevelt's "Big Stick"? This policy allowed him to test dangerous waters without getting his feet soaking wet.

Is IBM wielding its own big stick as it embarks on a planned course of sustained, double-digit growth throughout the '80s? Since the U.S. vs. IBM antitrust suit was dropped, IBM has positioned itself in a way that must look foreboding — if not menacing — to many of its competitors.

For example, IBM recently announced it would begin restricting or eliminating access to certain licensed program materials, including source code and logic manuals (story on Page 67). Those who oppose the policy change claim that IBM can, if it so chooses, severely undermine the efforts of independent systems software houses to compete effectively with the world's largest software company which, of course, is IBM.

The same people also claim that IBM can, if it so chooses, decimate the plug-compatible vendors by restricting them from getting the code information they need to make their machines plug-compatible.

Simple strategy, simple analysis. Devastating results.

But there are those who say IBM does not want to hurt the third-party vendors, much less annihilate the plug-compatible manufacturers, thereby stirring the antitrust ghosts once again. IBM, these people claim, is acting in its best interest by protecting its technology. The company does not want to anger its users and certainly does not want to delay implementation of MVS/XA, its new operating system software, by denying users the development tools they require.

In reality, no one but IBM knows just how restrictive it will be with its program materials. No one can guarantee that he will be denied program materials that someone else can get. No one knows the full range of products to which the restrictions will apply.

Consider another positioning move made by IBM. Last year, the company formed IBM Credit Corp. to phase the parent company out of direct interactions with the used and leased markets. The IBM Credit Corp. could, if IBM wanted, swing deals that would destroy third-party dealers, many observers and dealers feel.

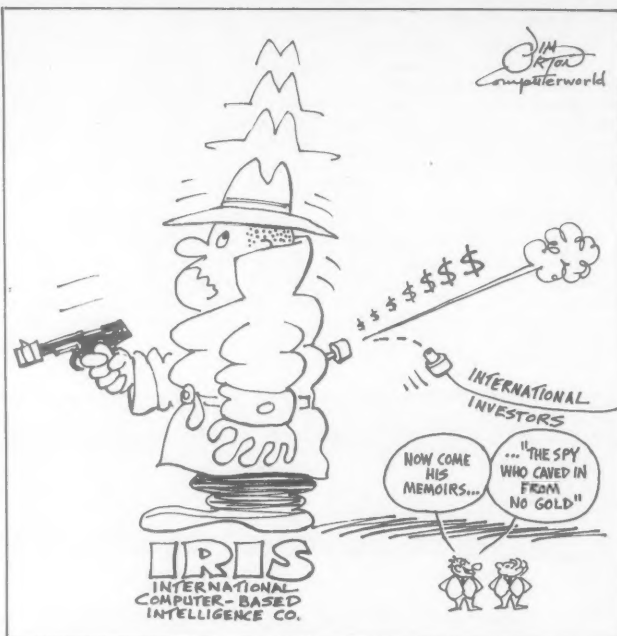
The dealers do not believe IBM would do such a thing. IBM needs the dealers, they claim. But if IBM wanted to...

Then there is IBM's recent "aggressive" pricing strategy. IBM knows that if it wants, it can cut its prices and its competitors would have to perform their own profit surgery and write down inventories.

There has been some resistance. The European Common Market countries have filed a complaint charging IBM with unfair competition, and the Association of Data Processing Service Organizations, Inc. has suggested that IBM is up to its old software bundling tricks.

Still, like Roosevelt's gunboats, IBM is poised. But poised to do what? Can all the scenarios envisioned by the antitrust squads actually come to pass?

Did Roosevelt envision a Western world dominated by the U.S.? Perhaps not. But it happened anyway.



LETTERS

Key to Systems Usability

I was immediately attracted by the lead of Edmond H. Weiss' In Depth ["Usability: Toward a Science of User Documentation," CW, Jan. 10]. He is indeed correct in noting that there is a new emphasis on usability within the systems-building community.

However, Weiss has missed the point of systems usability. What Weiss wrote was an excellent article on preparing user documentation.

To dismiss usability as a "catchword of tired computer people" and to write "the key to usability, of course, is user documentation" probably shows bias. The key to usability, of course, lies in systems design.

The most complete, grammatically correct, well-packaged user manuals (Weiss only gives passing notice to any other type of documentation) will not increase the usability of a system. It will allow those who must use the system to learn how to more quickly — but that's all. As Weiss rightly observes, good documentation should make itself redundant.

But back to usability. My dictionary tells me that usability means "the state or quality of being usable." This quality can only be achieved through systems design, by designing a system that users will want to use because it helps them do their jobs. Those who will use the system must regard it as an aid; no amount of written instructions on "how to" can hope to achieve this.

Tools and techniques available during design to ensure usability are: correct and usable dialogues designed for the appropriate audience, use of scenarios and demonstrations to ensure the system will meet the users' needs and an external architecture to allow it to be delivered piece by piece and provide for ease of maintenance and enhancement.

With these in place, good documentation can contribute to under-

standing and provide answers to day-to-day questions.

W.E. Harmer

Toronto, Ont.

Who Needs Assistance?

In response to *Computerworld's* editorial "Talk Is Cheap" [CW, Feb. 7], I am ashamed that a publication that represents a profession that is trying to improve its image as business thinkers would publish such an economically illiterate editorial. The basic message presented was the politically ancient one of "reduce the budget deficits, but don't gore my ox doing so."

Of all U.S. enterprises, the computer industry rates high among entrepreneurial firms that have taken high risks and have reaped high rewards for innovative achievements. Highly successful and profitable firms such as Digital Equipment Corp. have the least need for government assistance, yet the editorial seems to imply that there was a cause-and-effect relationship between the reduction of government handouts and DEC's decline in earnings.

If I were a DEC employee, I would be embarrassed by the fact that the amount of direct and indirect government assistance received by DEC is now common knowledge to *Computerworld* readers.

As a taxpayer and sufferer from high interest rates, I agree that the reduction of federal budget deficits should carry a high priority. However, I am not audacious enough to argue that federal assistance should not be eliminated to an industry that has historically been profitable and least needs the assistance.

James R. Rohrman
Manager
Information Systems

Kroy, Inc.
St. Paul, Minn.

SOFTLINE/Werner L. Frank†

Fake Apples in Hong Kong: Rotten to the Core

While I was in Hong Kong recently, my curiosity and interest were strongly aroused by a bold headline in *The Asian Wall Street Journal* identifying Kowloon Street as "the place to find a fake [Apple Computer, Inc.] Apple II computer."

Following the instructions given in the article, I soon found myself strolling through an open-air market crammed with electronic gear offered for sale alongside vegetables, live frogs, birds and snakes. Indeed, the crowded street was a typical oriental bazaar where traditional wares were mixed with products of modern technology.

The influence of the computer is also evident at the nearby Golden Shopping Center, which is comprised of a collection of indoor retail shops that are slowly being converted to computer store outlets.

In Full View

Out on the street, the "fake Apples" were in full view, operating in about a dozen niches along the storefronts. Four categories of computer gear were available: assembled Apple II units, boards and components, software and computer-related books. All were the so-called counterfeits or pirated material about which we hear so much.

Because of the focus on Apple computers, locals are beginning to designate the area "Apple Street," a name that seems appropriate in light of the prominence and ubiquity of stickers and posters displaying the well-known Apple logo.

	HONG KONG	U.S.
Additional 16K Bytes of Memory	\$ 42	\$100
Zilog, Inc. Z80 Softcard	46	255
80-Col. Monitor Board	58	249
Disk Controller	38	335
Printer Interface	102	155
Disk Drive	273	275
Monitor	103	89
Printer	492	475

Price Comparison

The price range on the offered "Apples" was from \$260 to \$370 in four categories. The difference in price is determined by the origin of the fake device. If it is from Japan, it commands the high end of the scale and if from Taiwan, the price is lowest.

The power unit appeared to be the same for all categories. In fact, we were told that the components are basically standard and most are made in the U.S. The purported difference was in the quality of the mother board and the actual mountings of the components. Clearly, guarantees were not available. The units went by such names as APII, Apollo II, Golden and Orange.

'Apple-Compatible'

The claim, of course, is that these computers are "Apple-compatible." In fact, in the *Asian Business Weekly*, the Taipei-based company Unitron, Inc. blatantly advertises the Unitron II Personal Computer as an Apple II-compatible and Digital Research, Inc. CP/M-compatible device including a MOS Technology 6502 CPU, 48K bytes of random-access memory

(RAM), 12K bytes of read-only memory (ROM) and 2K bytes of ROM for I/O. Accessories mentioned in the ad include: floppy disk drive and controllers, printer cards, Zilog, Inc. Z80 "soft-card," erasable programmable read-only memory writer, 16K bytes of RAM cards, language cards for Pascal, Fortran and Cobol, an integer Basic card, an 80-col. video card and a PAL card. In the same publication, similar ads from Inter-Orient and World Computers indicate that there is plenty of competition in the fake Apple market.

The Taiwanese are not alone in the business of copying computers. A device from the Philippines described in a recent issue of *Asian Computer Monthly* is a Radio Shack TRS-80-compatible system based on a Z80 microprocessor, 32K bytes of memory and 12K bytes of ROM. The manufacturers claim that this system offers improvements that are not available on the TRS-80, such as a bus-oriented structure, faster cassette I/O and higher resolution video with a reverse display feature. While only a prototype is currently available, the objective is to produce a

high-quality product for less than \$1,000.

Fake Apples are available at about 20% of the list price of legitimate hardware from Apple. No wonder this company is now in litigation protecting its interest.

Accessories and Peripherals

In addition to obtaining bargain-counter computers, it is possible to get accessories and peripherals (see box above). The U.S. prices shown represent recently published, discounted — not list — prices.

It is interesting to note that piracy is practiced with respect to circuit boards and not electromechanical parts. In the same store that carried the bargain-counter computers, an authentic Osborne Computer Corp. computer was on sale, priced at \$2,000, which is higher than the U.S. retail price by several hundred dollars.

What is the legal issue here? Is producing electronic "compatibility" illegal? The notion of plug-compatible manufacturers has apparently obtained general acceptance, at least in mainframe circles. The purveyors of the hardware copies assert that they are simply assembling the same components Apple does and, hence, are breaking no laws.

However, this is not the case. The issue is one of compromising the copyrights that belong to Apple and others. The procedures in ROM are being claimed by Apple to be its proprietary and protected asset. A legal

(Continued on Page 24)

HUMAN CONNECTION/Jack Stone†

Start Training DPs First Day on the Job

My article "DP Experience: Hire or Nurture From Within?" [CW, Nov. 29] brought forth a mailbag of reader responses. In this series, I will present segments of letters that typify reader viewpoints.

Les Batemate, systems and programming supervisor at Home Savings of America, Los Angeles, described what may be a unique training program that involves the employee from his first day on the job.

"I've been in data processing since 1967, and most of my experience has been with companies that either did not promote from within at all or did so only on a very limited basis," he said.

"A company posture of not promoting from within accomplishes at least two things, neither of which are positive. The first is that the company leaves the employees with the attitude: 'You've got the job you were hired for and that's as far as you're going with us.' The second is that employees have no particular reason to expand their education unless it will help their marketability in the next job-hunting session.

"When a company establishes a policy of internal hiring, employees are much more apt to prepare them-

This is the first in a two-part series titled "Should We Hire or Nurture DPs?"

selves for the next step up. They may do this on their own or it may be a result of encouragement by the company. If the preparation is done on the employee's own time, there is no cost to the company."

Intertwined Futures

"Of course, the positive feelings that are generated with such a policy cannot be measured," Batemate said. "It certainly increases the feeling of belonging to a team and indicates that both the individual's future and the company's future are intertwined.

"In my previous job, which lasted four years, I received good reviews, but only one position promotion. By reviewing the company's track record on hiring, I finally figured out that I had gone as far as I could. My firm simply did not promote from within for their higher positions.

"Before looking for another job, I discussed my perceptions with my supervisor. She had been with the company for over 10 years, and I felt

that if I were wrong, she would point out the errors. She listened attentively and when I finished, all she could say was that she agreed with me.

"Two weeks after I left the company, she quit for similar reasons. The company lost 14 years of experience between the two of us, not to mention the future potential. Managers worry about training costs and what they lose if the trained employee leaves. But what about the cost of replacing 14 years of company experience?"

A Training Plan

"A training plan needs to get underway from the moment a person is hired," Batemate said. "Training to help the new hire adjust to his new environment will greatly reduce the time it takes for him to become productive. After the new hire has been with the company through the probation period, it is a good idea to discuss what he has in mind for future goals.

"A training curriculum should be established to help the employee reach those goals. An allocation of hours should be made for training time during the workweek. Records should be kept of employee progress with training, and the employee

should be provided with some method of critiquing the courses and reporting his findings.

"A combination of video training, which allows each DP to go at his own speed, and in-house formal training, given by senior staff members, seems to work best. All training courses that are completed would become part of the employee's profile. When opportunities for advancement present themselves, these employee profiles would be reviewed for possible candidates.

"What I have just reviewed is a thumbnail sketch of the training program where I now work. This is the first company that I have worked for with this kind of program, and the differences in morale and professionalism are obvious.

"It should also be noted that the average length of employment for the data center here is seven years, ranging from new hires to over 15 years, and that says a lot for the benefits of an ongoing, continuous training program.

"To wrap it up, I view the issue of whether to hire or to nurture from within this way: The company must pay the price for experience either way, but by nurturing, its return on investment is far greater."

Barriers to Understanding

Perhaps the greatest single problem that faces data processing directors who seek to secure properly their data and the means of processing it is understanding what the problems actually are.

Among the barriers to achieving that understanding are inaccurate reports of computer-assisted crime that appear in the general press and trade press.

The result is the selection of security measures that, on the one hand, are applicable to problems that DP directors do not have and, on the other hand, do nothing for the problems they do have.

Consider the article "Bank of America, Merrill Lynch Hit by Scam" [CW, Dec. 20] on the attempted theft from Los Angeles' Bank of America and Merrill Lynch, Pierce,

Fenner and Smith, Inc. of Los Angeles. It is essential to an understanding of what happened in that case that we distinguish between console operators and terminal operators, between modification of data and modification of programs and indicate whether even modest safeguards were in place and breached.

It is my understanding that the "computer operator" in question was at a terminal, that he modified data, not programs, and that the code did not contain any meaningful safeguards.

Robert H. Courtney Jr.
President

Robert Courtney, Inc.
Port Ewen, N.Y.

LETTERS

Management Tech Degree

I read with great interest the article "MIT Offers Degree in Technology Management" [CW, Dec. 6]. I applaud MIT's efforts. Clearly, more programs of this nature need to be offered by more schools.

In that vein, I must inform you that MIT is not the first in the nation to offer a master of science degree in the management of technology.

American University, Washington, D.C., has offered a master of science degree in management of technology for over 20 years.

American University's program is similar to MIT's; they are both aimed at preparing graduates to assume

roles of increasing managerial responsibility for technology-based organizations.

However, the program at American University does allow students to specialize, or major, in the following fields:

- Computer systems applications.
- Management information systems.
- Operations research.
- Environmental systems.
- Scientific and technical information systems.
- Science, technology, policy and administration.

The prerequisites for the programs at American University and MIT are comparable. However, American University does offer both a thesis and a nonthesis option for graduation.

Donal D. Hogan
Systems Analyst

Columbia, Md.

Fake Apples In Hong Kong

(Continued from Page 23)

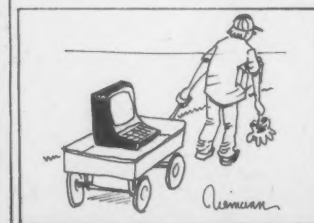
action is now under way to establish this point of law. In the meantime, U.S. Customs is on the alert to confiscate illegal Apples should they be brought to our shores.

If the legalities are not yet clear with respect to hardware, the same cannot be said for software. With complete disregard for proprietary rights, the shopkeepers in Hong Kong have diskettes marked with well-known brand names, such as Xerox Corp.'s Wordstar and VisiCorp's Visicalc. Each is a pirated copy of software (some from protected versions) offered at 15% of the U.S. list price. It is also possible to purchase Taiwan-produced photocopies of the software-associated documentation for approximately \$6/copy.

U.S. software authors and publishers are beginning to react to this counterfeiting threat. Software vendors have recently formed a special group within the Association of Data Processing Service Organizations, Inc. to gather industry support and generate action in dealing with the problem of protection and other issues of common concern.

It is estimated that the quantity of unauthorized copies of software in the U.S. equals about 40% of those that currently exist and is many times that number overseas. Although the same problem of counterfeiting exists today with respect to video cassettes, the economics for software are aggravated because the total dollars involved are greater by almost an order of magnitude. The industry is, therefore, in desperate need of an innovative approach to mitigate these economic losses.

Frank is an independent consultant and president of the W.L. Frank Computer Group located in Calabasas, Calif.



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'Superbug' Enhances CMS capabilities Intel Buys Tool to Speed DBMS Testing

By Lois Paul
CW Staff

AUSTIN, Texas — Even software vendors are turning to packaged solutions these days.

The quest for a better way to test future releases of its System 2000 data base management system (DBMS) led Intel Corp. to buy a debugging package from the small, Hartford, Conn.-based Technology Consulting Corp. The debugging package, Superbug, essentially provided an enhancement for IBM's CMS debugging

capability.

"CMS has a good debugging capability but, for some reason, IBM didn't really carry it through as fully as [it] could have. It is not really a nice, flexible capability," observed Jim Craig, development manager for the IBM VM version of System 2000.

The main thing Superbug provides is support of breakpoints in the Writeable Discontiguous Shared Segments (WDSS) available in CMS, according to Craig. Breakpoints allow a programmer to stop the execution of code at preset points so he

can query all of the registers and data areas and see what is happening.

WDSS provides common storage in the nucleus of the software system that can be used to communicate between machines. Craig explained that this is essential for the IBM version of System 2000 because the DBMS communicates across virtual machines and supports concurrent updating in the CMS environment.

The fact that IBM's CMS debug package does not support breakpoints in a WDSS does not concern most people, Craig ad-

(Continued on Page 28)

Cincom Utilities Target Total For PDP-11s Under RSX-11M

CINCINNATI — Cincom Systems, Inc. has announced a package of utilities for the company's Total data base administration function for Digital Equipment Corp. PDP-11 computers under RSX-11M.

Total Utilities enables the user to perform functions including unload and reload of individual data base files, initial loading of data base files, adding and deleting records from data base files and pro-

duction of data base statistics, according to a spokesman for the vendor.

A spokesman said records can be loaded into a newly defined data base on a file-by-file basis without the need for special programs. Records can be added and deleted on an individual basis. Data base statistics provided include number of chains, average, shortest and longest length of chains, number of active records, number of synonyms and number of out-of-block synonyms.

The utilities costs \$1,750 for PDP 11/23s and 11/24s, \$3,000 for PDP 11/30s to 11/60s and \$4,000 for PDP 11/70s from Cincom at 2300 Montana Ave., Cincinnati, Ohio 45211.

Vtvm Interface Added to Adabas To Support DDP

RESTON, Va. — Software AG of North America, Inc. has released a data base management system interface to support data base processing in a distributed environment.

Adabas/Vtvm is said to allow application program processing and Adabas data bases to be located anywhere within the organization, permitting the location of data and application processing to be based on business requirements and not on software and hardware limitations.

Adabas/Vtvm runs on IBM and plug-compatible mainframes under MVS, OS/VS1 and DOS/VSE. Prices start at \$24,000 for the first pair of nodes in a network with lease plans available. The vendor is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

Aid Withholds Mandatory Taxes

ATLANTA — Business Software, Inc. has announced Pensiontax, a software package designed to withhold the mandatory taxes required under the Tax Equity and Fiscal Responsibility Act of 1982 from pensions, annuities, stock bonus plans, Individual Retirement Accounts or profit-sharing plans.

Offered in Ansi Cobol for most mini and mainframe systems, Pensiontax was designed for the specific purpose of deferred income taxation, the vendor said. It reportedly supports tax methods for normal, supplemental, advance, cumulative and nonresident periodic payments, as well as flat percent, advance and qualified

total distribution nonperiodic payments. The software will compute the tax on either gross or net payments, as well as on additional amounts or percentages as requested by recipients. The package automatically converts taxing authority codes to equivalent Pensiontax codes.

The price of the software, which includes one year of support, is \$4,900. Pensiontax Support Service, which is priced at \$900/year, furnishes updates, periodic enhancements, documentation updates, installation assistance, telephone consultation and an ongoing warranty, the vendor said from Suite 107, 3957 Pleasantdale Road, Atlanta, Ga. 30340.

'Guardian' Gets DL/I Support

FORT LEE, N.J. — On-Line Software International, Inc. has announced enhancements to its Guardian on-line IBM CICS security system including full DL/I support and permanent on-line maintenance.

Guardian reportedly allows CICS users to make changes on-line to security policy, allowing new resources to be added or deleted dynamically.

Prices start at \$20,000 for DOS and at \$27,500 for OS from the firm at Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

SOFTWARE & SERVICES

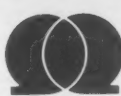
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Shared Tape Allocation Manager, STAM, automatically manages mountable devices, (tape and disk), in multi-CPU installations. Allocation decisions for shared device pools are made automatically, thus eliminating the potential for disastrous operator errors and more effectively using these valuable resources than is possible with manual control.



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Do You Have a Story to Tell About DP Manufacturing Systems?

CAM, MRP and FMS are some of the hottest new topics in the world of computers. *Computerworld* wants to tell its readers more about computer-aided manufacturing, materials resource planning, flexible manufacturing systems, robotics and shop floor control. But we need your help.

The April 25 issue of *Computerworld* will provide in-depth coverage of manufacturing in transition and the part computerized systems are playing.

We are looking for articles on how the new manufacturing technologies fit together and what they all mean to DP operations in

a manufacturing environment.

Industrywide tutorials on all aspects of computers and manufacturing are welcome. Other areas of interest include user experiences, application stories, studies, management strategies and psychological effects.

Articles should be between five pages and eight pages, double-spaced and typed. The deadline is March 18, but the sooner we get your manuscript, the better the chance it will be used.

Submit your stories to Bruce Hoard, *Computerworld* Editorial, P.O. Box 880, 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

For Displaying IBM Vsam Info On-Line Tool Announced

BOSTON — Corodale, Inc. has unveiled an on-line programming tool for displaying IBM Vsam catalog information at a CICS/VS or Altergo Products, Inc. Shadow II terminal.

Vsam/Display, as the product is called, runs under IBM's DOS/VS or DOS/VSE with a minimum partition size of 128K bytes. It reportedly provides an interactive menu-driven environment in which the user can retrieve various levels of information about Vsam clusters and paths. With this software, the user can browse Vsam clusters and paths, using selection criteria such as cluster type, cluster name or both. Creation and update dates are included in the display.

Detail information for a specific cluster also may be displayed, the vendor said. If the cluster is a Key Sequenced Data Set (KSDS), detail information is displayed for both the data and index components. Detail information includes component attributes; Execute Channel Program count; number of records added, deleted or replaced; high used and allocated relative byte address; key position; device type; allocation unit; and disk utilization percentage. The names of the associations and extents of a specified cluster may be displayed as well, the vendor said.

Vsam/Display is available immediately, and its permanent license fee is \$1,500. It also is available on a one-year lease basis for \$120/mo, the vendor said from 211 Congress St., Boston, Mass. 02110.

For more security, convenience, throughput, and cost savings, Tri-Data's Total Network Modem.

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'Zeke' Gets Report Features

ARLINGTON, Texas — Southwest Software Services, Inc. has announced Release 2.0 of Zeke — The Controller, an automated scheduling and dispatching package for users of IBM's DOS/VSE operating system and IBM's VSE/Power software utility.

Release 2.0 contains a report writing facility that allows users to tailor scheduling and management reports. The user can define selection criteria, desired fields, page breaks, sequences and formats. In addition, several standard reports are automatically produced, the vendor said.

In addition, Release 2.0 includes a forecast feature, which allows users to schedule future reports, the vendor said.

Release 2.0 costs \$9,500, for a permanent license, the vendor said from 36022 E. Randol Mill Road, Arlington, Texas 76011.

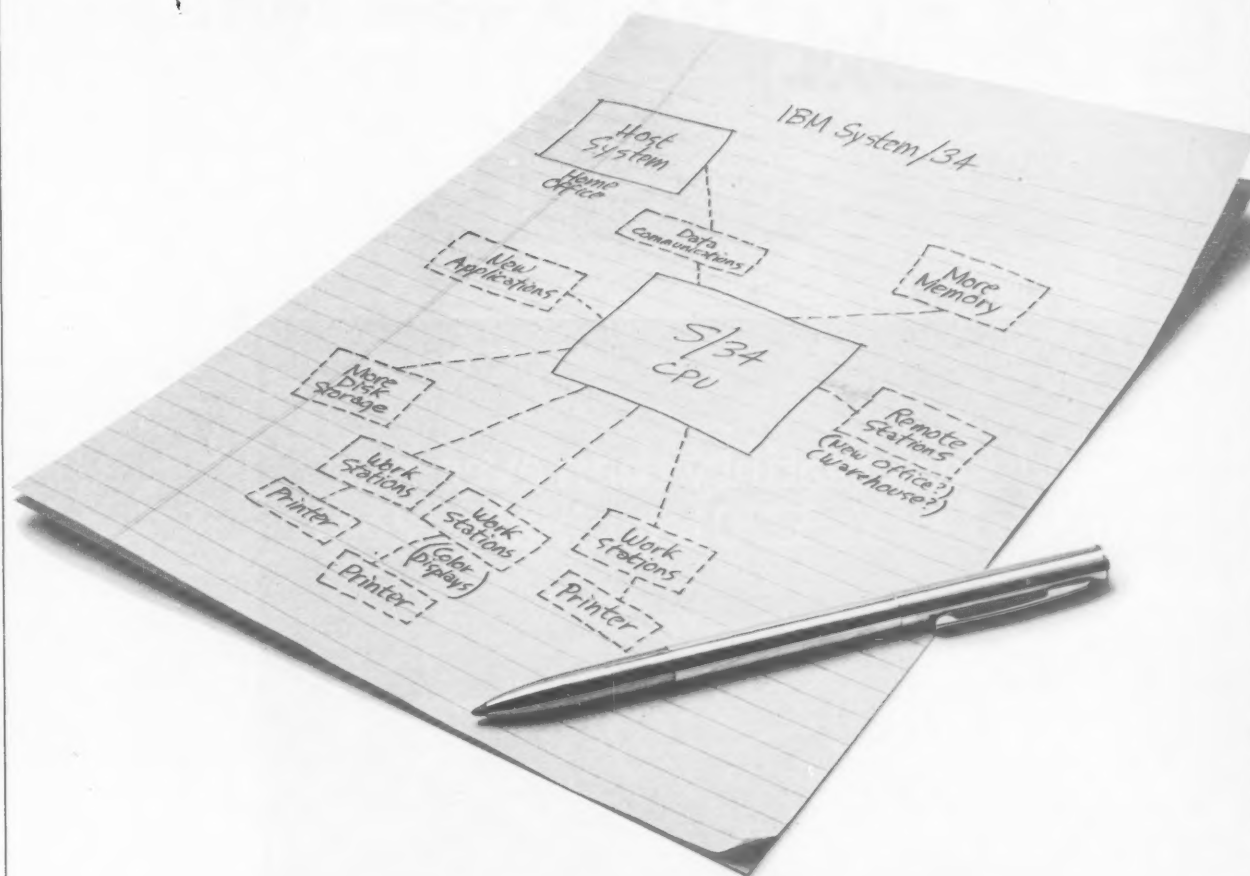
'C-SLF' Targets Univac Users

DOWNERS GROVE, Ill. — Circle Software Corp. has announced Circle-Systems Library Facility (C-SLF), a set of callable subroutines that is said to allow Cobol, Fortran and assembly language programs to read and write Sperry Univac librarian files.

The package runs on Univac 90 series and System 80 hardware under the OS/3 operating system. C-SLF augments standard I/O functions with Find and Stow functions to process the library directory, a spokesman said.

C-SLF can be used to find references in a particular data set or to locate where a particular Cobol structure is used, the vendor said. The package allows custom programs to be created to extract answers to questions from librarian files.

C-SLF is also said to simplify language upgrades, system changes, new hardware or data structure changes. A license costs \$395 from the vendor at Suite 240, 1100 31st St., Downers Grove, Ill. 60515.



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Intel Turns to 'Superbug' Package To Aid in System 2000 Testing

(Continued from Page 25)
mitted, "but it so happens that with System 2000 we really needed that to manage some quality assurance testing that we wanted to do, transferring this data between machines."

"We wanted to be able to step through the code an instruction at a time and see what was going on and make

sure it was all just exactly right, because it is much easier to do it that way then to try to debug something and have something go wrong when you are running it at nanosecond mode when you are really in production."

As a software vendor, Intel's first response was to build in the necessary code itself. "We were surviving,"

Craig noted, "but we weren't really happy with having to go to all that trouble."

When an advertisement announcing Superbug arrived in the mail about seven months ago, Craig was assigned to evaluate it as a possible solution. As it turned out, Superbug initially did not support WDSS. "They improved the product by working with us on the phone," Craig said about Technology Consulting. "I think that helped both companies. We wound up with what we needed, and they wound up knowing how to do some stuff also."

The current version of Superbug that Intel is using allows Craig's group to set breakpoints in WDSS and to control who has control. "It does exactly what we need," he said. Craig noted that the code in the WDSS used by System 2000 is important and contains some privileged instructions. Because of this, it has represented somewhat of a bottleneck.

'Can Monitor Everything'

Before it began using Superbug, Craig's group had problems determining exactly how many instructions were being executed so it could minimize them. "With Superbug, that problem goes away. We can monitor everything," Craig said. "Besides, we can do without certain instructions that we require with other operating systems. We have found several things that we can do without and speed things up a little bit without sacrificing the integrity of the system."

Other features that Intel has discovered in Superbug include the ability to keep breakpoints set (IBM's CMS Debug requires manual resetting of breakpoints each time they are passed, Craig said) and to name the breakpoints, which has enabled Craig's group to set up a data dictionary that says where all the data areas are and labels the breakpoints.

"In the case of System 2000, our data areas are fairly standard. We don't change them with every release. So we were able to set up some little dictionaries for our use and more or less automate the way Superbug works to integrate it with System 2000 a little bit. So now our programmers don't have to go through and redefine anything."

Although System 2000 users will not see any Superbug code or realize the results of it specifically, Craig said they will see better releases of the product because of Intel's use of this package.

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Method/1 Project Manager Receives Series of Updates

CHICAGO — Arthur Andersen & Co. has introduced a series of updates for its Method/1 project management and systems development methodology.

Two areas of the methodology were enhanced. Under Information Planning, updates include new methods for tying systems into the organization's overall strategic plan, planning approaches to office automation and planning methods to document current information needs and establish application strategies. Under the Systems Programming project, updates covered the follow-

ing three areas:

- The design phase — includes an enhanced approach to address the expanding availability of application software and systems development tools. An approach to systems prototyping is included.

- User training — techniques for developing end-user procedures have been defined.

- Systems management — extensively enhanced in the areas of production systems support, the maintenance function, to provide thorough management guidelines in the day-to-day systems operation.

Other updates include new topics in the areas of telecommunications and data security.

The updates are provided to current Method/1 users, either under the initial lease arrangement or after expiration, as part of an annual service agreement. The Information Planning service agreement costs \$2,500, and the Systems Programming project service agreement costs \$4,000 from Arthur Andersen & Co., 69 W. Washington St., Chicago, Ill. 60602.

Utility Tools Fit Honeywell

PHOENIX — Technology Information Systems, Inc. has announced five utility packages intended to enhance the performance and productivity of Honeywell, Inc. large-scale systems.

The Generalized Monitoring Facility is a software systems monitor designed to aid in analyzing system performance problems. It is available with training for \$985.

The Performance Enhancement Package (PEP) is a systems-oriented software product intended to enhance the throughput of Honeywell Series 6000, Level 66 and DPS 8 systems in the range of 20% to 50% with no hardware modifications, the vendor claimed. PEP-1, for small systems, is available for \$20,000. For medium-size systems, PEP-2 is priced at \$60,000. PEP-3, which is for large-scale systems, is priced at \$100,000, according to the vendor.

The Storage Enhancement Package reportedly increases the mass storage capacity of Honeywell devices and reduces I/O overhead of removable and fixed-mass storage units. The package is available for \$25,000.

Readcobol, a program designed to reduce Cobol maintenance, is said to arrange programs into a standard format and to allow for retroactive standard implementation. It is priced at \$7,500.

Speedcobol is intended to reduce the number of programmer keystrokes in either a standard or user-defined shorthand notation or both. It is available for \$3,000.

Maintenance for these products is mandatory for the first year and costs about 15% of the purchase price of the software, the vendor said. Technology Information Systems is located at Suite 808, 2721 N. Central Ave., Phoenix, Ariz. 85004.

Spreadsheet Out For Wang VS

GLEN ELLYN, Ill. — Hourglass Systems has announced an electronic spreadsheet package for Wang Laboratories, Inc.'s VS series of computers.

Called Fast Figure, the package includes depreciation, present value and net present value, internal rate of return, compound growth functions, standard deviation and "what if" analysis, a vendor spokesman said. Three-dimensional file sharing allows users to prepare multiple reports from the same file without data reentry.

Fast Figure costs \$600 from Hourglass Systems, P.O. Box 312, Glen Ellyn, Ill. 60137.

New Generation Offers Packages For System/38

ROSEVILLE, Calif. — New Generation Software has announced packages for the IBM System/38.

Job Accounting/38 provides computer usage reports that can be accessed on the screen or in a printed format. A global rate system can be established to apply to all users or specific rates can be applied to users according to the following variables: fixed rate, CPU time used, clock time used, disk consumption and number of lines printed, a spokesman said. The price is \$1,500.

CPA Application Software offers 12 separately priced modules: practice management package, \$12,000; financial reporting, \$12,500; professional accounts receivable, \$4,000; financial modeling, \$975; tax estimating, \$950; payroll/checkwriting, \$6,000; staff scheduling, \$6,000; due date monitoring, \$4,000; random number generator, \$1,200; loan amortization, \$800; accounts payable, \$5,000; and depreciation, \$4,000.

Worksheet/38 is a spreadsheet financial modeling system featuring a 702-col. by 999-row matrix, relational modeling, Help features and advanced matrix manipulation, the vendor spokesman said. The price is \$975.

Additional information is available from New Generation Software, located at 341 Lincoln St., Roseville, Calif. 95678.



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Retail prices may vary at individual stores and dealers. Special order may be required. Some applications may require an optional extra Model 12 card cage. Hard disk requires card cage and installation, not included. IBM is a registered trademark of International Business Machines Corp. DEC is a registered trademark of Digital Equipment Corp.

'SAS/Replay-CICS' Out

CARY, N.C. — SAS Institute, Inc. has announced SAS/Replay-CICS, software designed to enable IBM CICS users to store, manage, manipulate, retrieve and replay SAS/Graph displays.

Until now, some CICS users have not been able to use SAS/Graph because terminals supported by this package were attached to CICS rather than to TSO or VSE, the vendor noted. With SAS/Replay-CICS, the output from SAS/Graph is placed in a special shared Vsam file, the vendor said.

SAS/Replay-CICS is described by the vendor as a simple data base manager with SAS retrieval capabilities. It is intended for installations where SAS/Replay-CICS is installed on a system other than the system on which SAS is installed.

The software is scheduled for availability to IBM DOS/VSE installations during the second quarter of 1983 and to OS installations during the third quarter.

It is priced at \$2,500 for

the first year license for current U.S. SAS customers, according to SAS Institute, Box 8000, Cary, N.C. 27511.

Emulator Out for Intel/DEC

DOWNERS GROVE, Ill. — A software emulator and program analyzer for programs written for Intel Corp. 8086/8088 microprocessors on Digital Equipment Corp. PDP-11 minicomputers has been introduced by Systems & Software, Inc.

BURLINGAME, Calif. — Bankpak, a software package designed for managing com-

Softprobe/86 is said to extend traditional debugging facilities.

The package runs on PDP-11s running under RSX-11M operating systems. Prices start at \$2,000 from 1319 Butterfield Road, Downers Grove, Ill. 60515.

mercial lending portfolios on Digital Equipment Corp. VAX-11 systems, has been introduced by McCue Systems, Inc.

The on-line system reportedly allows account officers to access up-to-the-minute data from a desktop terminal rather than depending upon daily batch reports. Data input is menu-driven. Bankpak can quote new loans and pay off terms, assign float days, share subportfolios with oth-

er institutions at adjusted rates and produce historical activity reports.

A one-time license fee for Bankpak costs \$55,000 including complete installation, on-site training and service support. A maintenance agreement is offered to cover software upgrades, and the package also is available on a time-share basis. McCue Systems is located at Suite 212, 330 Primrose Road, Burlingame, Calif. 94010.

Guide Lists Utilities

CHERRY HILL, N.J. — Data Decisions has released a directory of 190 programming support packages offered for most mainframes and minicomputers as well as for microcomputers running Digital Research, Inc. CP/M and MP/M and Bell Laboratories' Unix-based operating systems.

Products include report writers, application generators, flow charters, documentation aids, conversion/migration aids, simulation/modeling packages, editors, listers, performance/activity analyzers, test data generators, dump formatter/analyzers, job control language support packages, screen support packages and preprocessors.

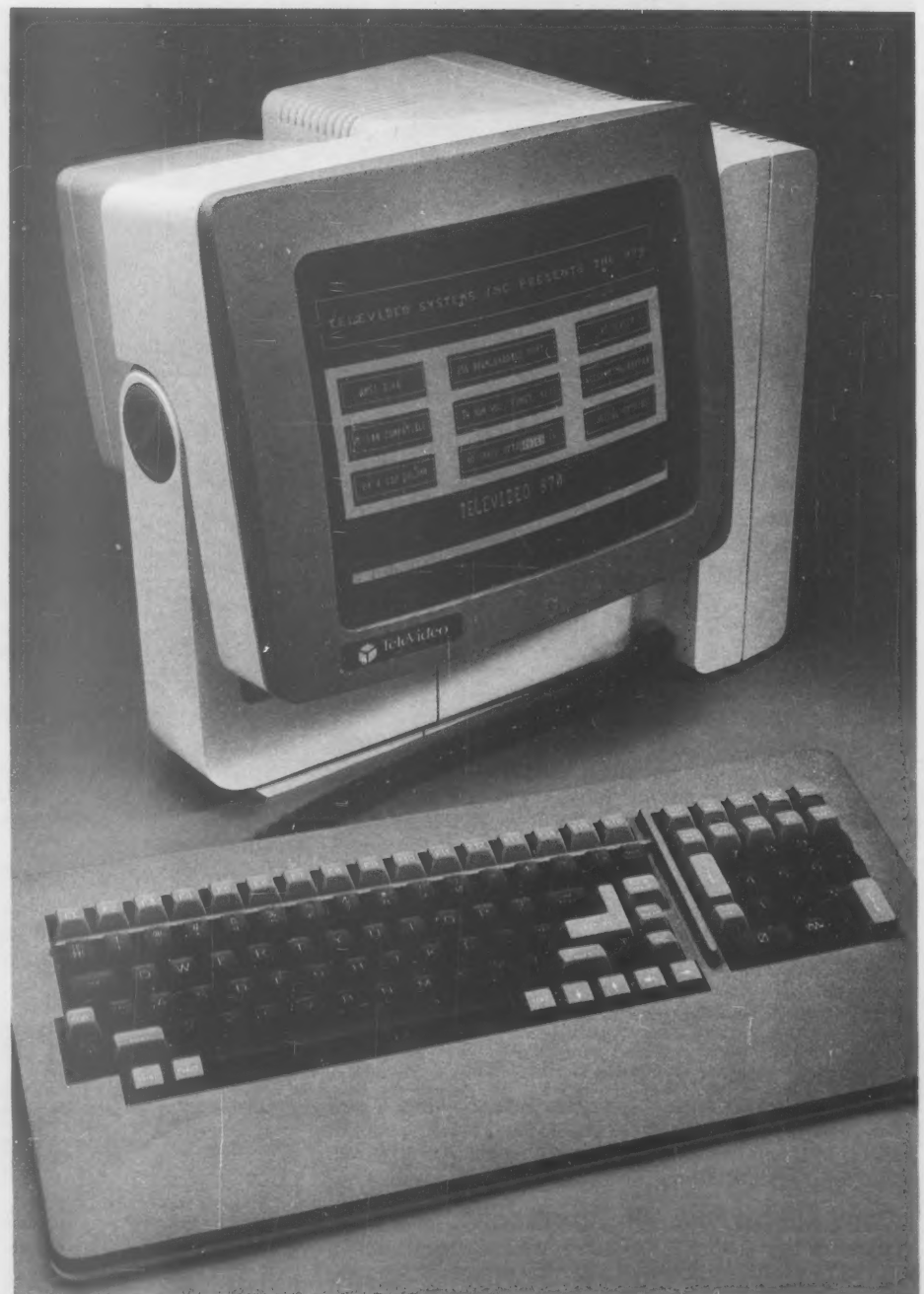
The "Programming Support Directory" costs \$25 from 20 Brace Road, Cherry Hill, N.J. 08034.

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JCL Generator Gets Support, Enhancements

ATLANTA — Eclectic Technology, Inc. has announced additional support for its Master JCL Generator, which was designed to enable users to build JCL and submit jobs from most teleprocessing environments.

Master JCL Generator is available for IBM MVS/TSO, MVS/CICS, VS1/CICS, DOS/VSE/CICS and VM/CMS systems.

Among its enhanced fea-

tures is the generation of JCL by installation-defined IBM 3270 menus. For non-full-screen terminals, JCL may be generated using keyword parameters similar to the MVS Clist facilities, the vendor explained. In addition, data entered during previous invocations may be recalled.

Master JCL Generator includes a distribution data base that contains menus for IBM utilities, Resource Allo-

cation Control Facility functions, Cobol, PL/I, Fortran and assembler. JCL may be reviewed and edited before job submission, according to the vendor.

In a production environment, user exits provide the facility of job submission without the user having access authority to data sets referenced in the JCL. Condition JCL statement generation is available, the

vendor noted.

The software may be purchased for \$7,500 or leased

for \$275/mo, the vendor said from 2978 Sumac Drive, Atlanta, Ga. 30360.

DG's SPSA Support Rates Raised an Average of 22%

WESTBORO, Mass. — Data General Corp.'s Software Services Group recently increased rates an average of 22% and expanded ser-

vices for its Software Product Service Agreement (SPSA), a customer support package for users of DG software products.

The new services apply to three levels of SPSA service:

- Level 3 — covers toll-free telephone assistance for users and fast distribution of software updates.

- Level 2 — additionally covers on-site service visits at no charge.

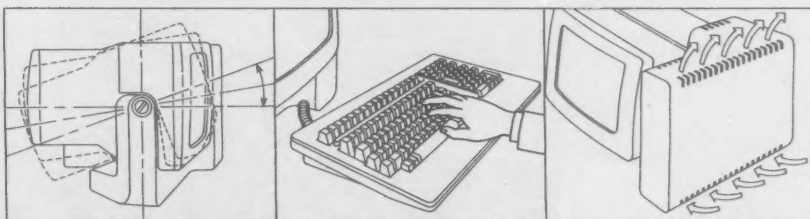
- Level 1 — includes Level 3 and 2 coverage plus quarterly on-site visits for consulting and preventive maintenance.

Also, the group introduced a plan to permit users to extend SPSA service to multiple operating systems at a reduced rate. Previously, separate service agreements were required for each operating system. The plan is intended for users of the firm's Real-Time Disc Operating System (Rdos) family of software, which includes the Disc-based Operating System (DOS) and the Interactive Cobol Operating System (Icos). Users reportedly can extend SPSA coverage for each additional operating system at a cost 30% less than a new agreement.

Enhancements to service under the SPSA include a monthly report on the customer's use of the toll-free telephone support service as well as a microcode subscription service for users of DG's 32-bit MV/Family computers.

More information is available from Data General, located at 4400 Computer Drive, Westboro, Mass. 01580.

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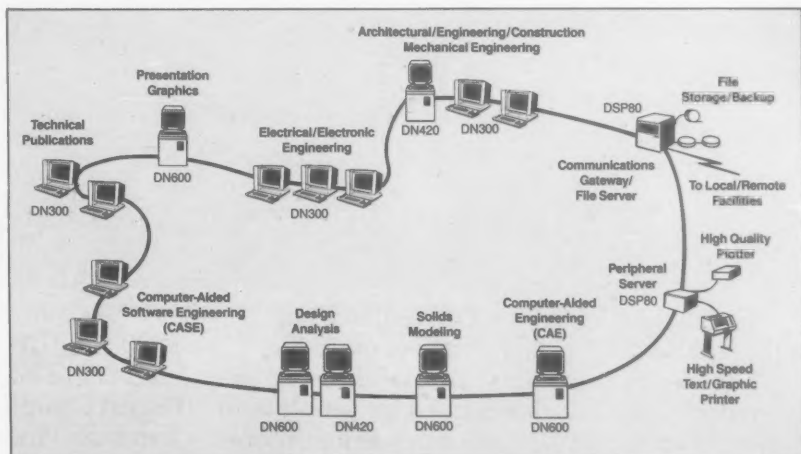
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Two Programming Modes Added Report Writer Enhanced

GRANADA HILLS, Calif. — Dylakor has announced Release 3.0 of DYLAN-280, an English-language report writer, utility and information management system running under IBM OS, DOS, CMS and SSX operating systems.

The new release adds two programming modes: structured coding for advanced programmers and user default for inexperienced programmers. The Structured mode supports nested IF statements, DO WHILE, DO UNTIL, and CASE commands as well as all subordinate keywords, a

spokesman said.

In addition, the copy facility of DYLAN-280 now supports Cobol definitions, enabling definitions and working storage descriptions to be copied directly into the program without recoding. The release allows data names up to 50 characters. Integer, decimal and negative exponentiation is now supported.

Other features include automatic label generation, support for numeric tag names and additional communications region support for DOS/VS and DOS/VSE.

The package costs \$1,680/year on a three-year lease from 17418 Chatsworth St., P.O. Box 3010, Granada Hills, Calif. 91344.

Clist Interface Updated for SAS

WETHERSFIELD, Conn. — Northeast Utilities has released Version 2.0 of its SPF/SAS Clist interface. This is a panel system written in IBM's TSO and System Productivity Facility (SPF) Dialog Manager designed to increase productivity for users of SAS Institute, Inc.'s Statistical Analysis System (SAS).

The SPF/SAS Clist consists of a main panel screen and an output processor. The first panel reportedly allows file and data set specification of the SAS program, SAS input or output files, SAS data bases, SAS options and, optionally, SAS/Graph peripherals. The panel is said to handle all allocations and calls to SAS. The second panel is designed to allow users to reedit and rerun a job with single keystrokes.

The package includes the on-line SAS software as well as a batch interface, and the systems are delivered with all panels, Clists, SPF skeletons, messages, documentation and installation instructions, the vendor said.

The SPF/SAS Clist is priced at \$250, including postage and magnetic tape costs. Full documentation is available at no charge. Northeast Utilities can be reached through Cary Prague, 176 Cumberland Ave., Wethersfield, Conn. 06109.

JOL Language Gets Enhanced

SACRAMENTO, Calif. — Software Module Marketing has announced that Release 3.4 of its Job Organization Language (JOL) command language for IBM and plug-compatible OS systems includes an enhanced scheduling capability.

The scheduling feature reportedly enables users to create job networks in both programming and data center environments and provides increased capabilities to existing JCL procedures. In addition, JOL may be used as a conversion aid for IBM DOS-to-OS conversions.

The MFT, MVT and VS1 versions of JOL are priced at \$50,000 for one CPU, and the MVS version is priced at \$60,000 for one CPU. Multi-CPU and multisite discounts are available, and additional discounts are available for VM/CMS sites.

The vendor is located at Crocker Bank Building/Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.



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For DEC Systems

Implementation of Mumps Out

BOSTON — An implementation of the Ansi-standard Mumps language for Digital Equipment Corp. systems ranging from the Professional 300 up to the VAX-11/780 has been introduced by Intersystems Corp.

Called Intersystems M/VX, the Mumps package includes a computer language, a data base system and utilities designed to facilitate application development. M/VS runs under the DEC VMS operating system, providing the facilities of this operating system as well as the

ability to run several languages on the same CPU, the vendor explained.

M/VX is said to take advantage of the expanded memory features of VMS, functioning as a partially compiled language while retaining the interactive programming environment of an interpreter, the vendor said.

Mumps/PC300, the version for the DEC Professional 300, consists of the Mumps language, an integrated data base system and a set of utilities. Mumps/PC300 is said to

be a complete implementation of the Mumps language.

The price of intersystems' Mumps implementation on the various size DEC systems it supports ranges from \$595 to \$19,500. This is dependent upon the configuration and the number of users supported. The vendor is located at 210 Commercial St., Boston, Mass. 02109.

Aids Target Univac 80

BLUE BELL, Pa. — Sperry Univac will provide transition aids to users converting applications from IBM System/34 computers to the Univac System 80.

The products include a library transcriber, data utility, operator control language converter, screen and data description converter, conversion guide, compatible RPG-II auto report, compatible sort, RPG-II compatibility, editor and general editor enhancements, screen format services enhancements and menu services.

The aids are free of charge to System 80 users from Univac, P.O. Box 500, Blue Bell, Pa. 19424.

CPG Offers 'SAM,' 'Fred'

PAOLI, Pa. — Custom Programming Group, Inc. (CPG) has unveiled two systems that run on Four Phase Computer Systems, Inc. minicomputers, the System for Archival Management (SAM) and the Fund Raising and Expansion Development (Fred).

SAM is a companion product for Four Phase's Foreword word processing users. It reportedly provides for the automatic moving of on-line documents to off-line storage with management reports of document location and last use.

Fred is a system for maintaining lists of donors and organizations that contribute time and money to institutions such as hospitals. It also provides ad hoc reports and accounting functions.

Both systems were written using Ansi Cobol 74 to run under Four Phase's MFE operating environment.

CPG will provide the services of installation, customization, interface to other systems and training. The price for SAM is \$2,500, with a \$250/mo license fee. Fred costs \$6,000, with a \$350/mo license fee. CPG is located at 1800 E. Lancaster Ave., Paoli, Pa. 19301.

Control Language Program Added to Trisys Series

SHREWSBURY, Mass. — Trisys, Inc. has announced the addition of the Control Language Analysis program, said to eliminate the error-prone task of updating by hand, to their series of IBM System/38 conversion and operation tools.

The program reportedly performs a complete analysis of the installation's control language and creates a series of reports that show the relationships among the files, programs and procedures in the applications software and between applications

software and the IBM utilities, according to a vendor spokesman.

The reports show where all files are created, used and updated; when events occur in a job stream; where and when control language programs call other control language, RPG and Cobol programs, the vendor said.

The license fee for the Control Language Analysis program is \$750. More information is available from Trisys, which can be reached through P.O. Box 274, Shrewsbury, Mass. 01545.

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Quality Assurance Packages Out for HP 1000

PALO ALTO, Calif. — Hewlett-Packard Co. has announced eight quality assurance software packages for HP 1000 series computers. The

packages were developed by Hansford Data Systems, Inc. of Rochester, N.Y.

Calibration is a calibration-sched-

uling system for gauges and test instruments.

Instruction Management provides on-line storage of instructions for receiving, sampling, inspection, assembly, calibration and other manufacturing functions.

Incoming Quality Management is a receiving-inspection, material-status and control system that offers master identification, status and historical information for each lot number.

Process Analysis provides numeric and graphics analytical tools for statistical quality control areas. It allows use of control charts, descriptive statistics or true-position analysis techniques for variables data.

Vendor Rating adds rating-system

capabilities to the Incoming Quality Management package.

Production Quality Management allows on-line storage and data management capabilities for variables data.

Coordinate Measuring Machine provides on-line data collection, data storage and data management capabilities for part measurement data collection.

Acceptance Sampling designs and analyzes lot-by-lot single-sampling plans for attributes, the vendor spokesman said.

Prices range from \$3,000 to \$10,000 per package.

The company is located at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Release 2.0 for IBM MVS Added to 'Sysout' System

SHERMAN OAKS, Calif. — Essential Software has added Release 2.0 for the IBM MVS operating system to its Sysout Archival and Retrieval (SAR) system.

Release 2.0 of SAR adds several features including a master Vsam directory of all archived Sysout, an option to generate and submit JCL to load archived Sysout from tape to IBM spool disk pack for printing under or subsequent viewing under

IBM's TSO/SPF, maintenance of complete Sysout attributes in the directory and archival selection by forms name.

SAR, including one year of maintenance and support, is priced at \$5,000. Essential Software is located at 14959 Jadestone Drive, Sherman Oaks, Calif. 91403.

NCR Users Get Finance Packages

FORT LAUDERDALE, Fla. — Commercial Data Corp. has announced two accounting software packages for users of NCR Corp. V-8400, V-8500 and V-8600 series computers.

The firm's Financial Reporting System (FRS) is said to handle actual and budget data, current-year period balances and up to 36 periods of history.

The chart of accounts reportedly is completely controlled by the user. FRS allows posting to any period, the vendor spokesman for the firm explained.

Like FRS, the Accounts Payable (AP) package offers multicompany capabilities.

This package is also said to provide extensive user-defined editing and processing options, according to the vendor.

FRS and AP each range in price from \$6,000 to \$10,000.

Commercial Data Corp. is located at 5100 N.W. 9th Ave., Fort Lauderdale, Fla. 33309.

Programs Out For System/34

JACKSON, Miss. — Executive Financial Software (EFS) Systems, a division of Mockbee, Edwards & Associates, has announced a set of programs for the IBM System/34 said to permit the user to perform a variety of financial calculations in an interactive format.

The set of programs, also called EFS, reportedly includes 23 separate functions such as investment cash flow analysis, present and future value calculations, simple and compound interest calculations and depreciation and amortization schedules.

It also includes a four-function calculator, a high-speed adding machine and a perpetual calendar.

A 200-page handbook is also provided.

A one-time license fee costs \$150 from EFS Systems through P.O. Box 22865, Jackson, Miss. 39205.

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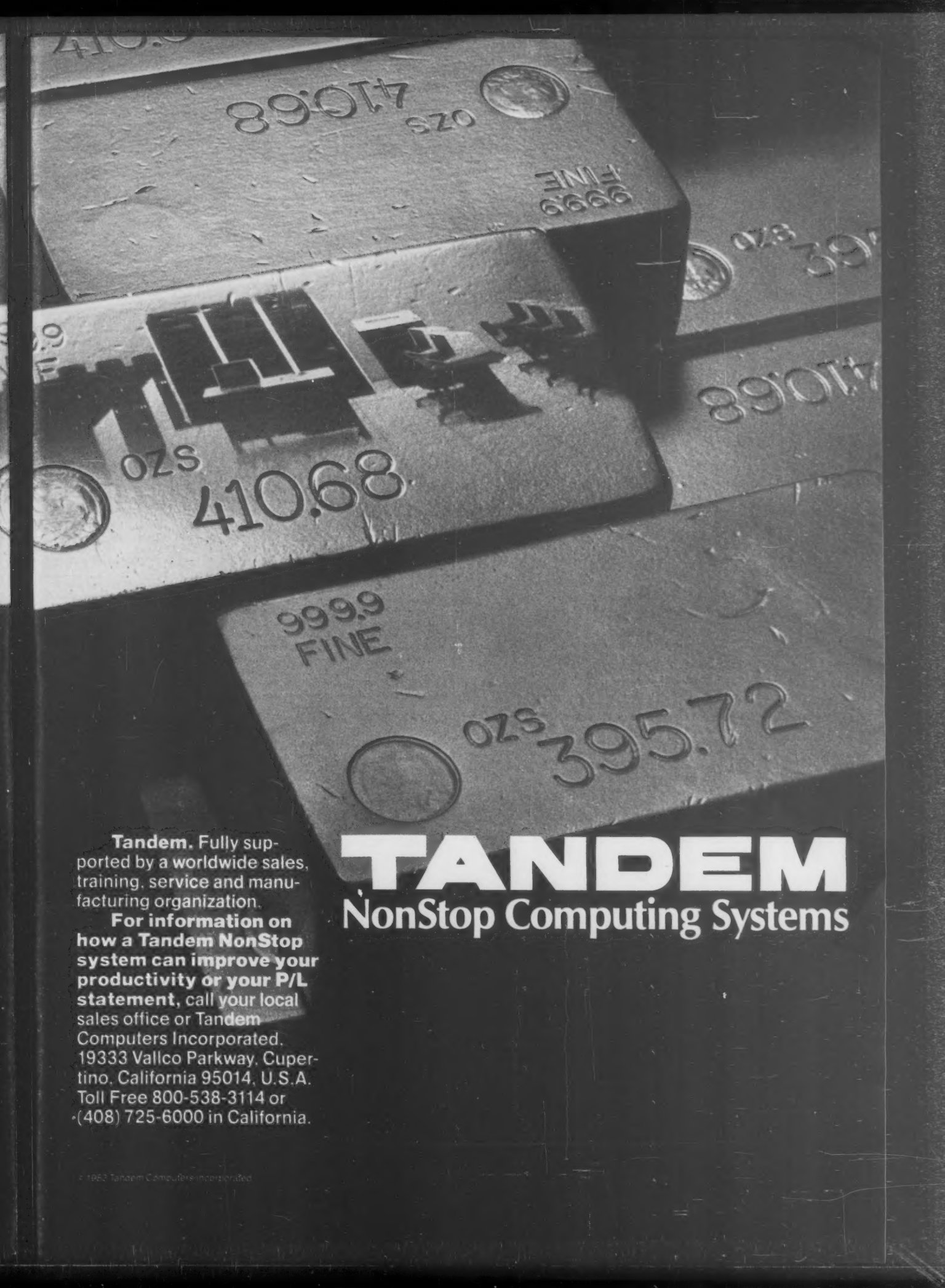
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The Tandem system also provides on-line inquiry capabilities that let govern-

ment agencies check on the status of their accounts at any time. In addition, government grantees can draw on allocated funds in a much more timely and cost-effective manner. The result has been a savings to the American taxpayer of \$245 million in the last year alone. And we project even greater savings next year.

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For Volume End Users

HP Pricing Program Debuts

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a Value-Added System Supplier program intended to slash prices on multiple copies of its application software products for both volume end users

and OEMs.

For example, a volume end user purchasing HP's electronic mail software for the HP 3000 series will pay \$10,000 for the first copy and \$5,390 to \$7,000 for the second through fifth copies. The vendor noted that this depends on the customer's level of business with HP during the purchase contract year.

The sixth through the fifteenth HP Mail packages will be priced between \$3,850 and \$5,000 each, with the price lowered to between \$1,924 and \$2,500 for the sixteenth and additional copies.

The new HP software pricing program became effective on Feb. 1 for all HP software products priced above \$1,000 (U.S. list). Further information can be obtained from HP at 3000 Hanover St., Palo Alto, Calif. 94304.

Pascal Compiler Fits MV Series

COLUMBIA, Md. — Rhintek, Inc. has announced a Pascal compiler for the Data General Corp. MV/8000, MV/6000 and MV/4000 series processors.

The compiler includes several extensions including external procedures, random-access I/O and source level %INCLUDE. The package will compile and run Pascal programs on any MV family processor under the APS/VS operating system. The compiler can also be configured to operate on 16-bit DG Nova processors under the APS or Rdos operating systems, a spokesman for the vendor said.

The compiler and routine library costs \$4,500 for an AOS/VS system, the vendor said. Rhintek can be reached through P.O. Box 220, Columbia, Md. 21045.

UIS Enhances Apex Service

KANSAS CITY, Mo. — United Information Services, Inc. (UIS) has announced an enhancement of its Control Data Corp. Cyber-based Apex service. The service now allows users to execute batch control statements and batch products during an interactive time-sharing session, a spokeswoman said.

Apex clients can now interactively access computers, utilities and software products that were previously accessible only through batch. UIS maintains major data centers in Kansas City and Pittsburgh, Pa., which house CDC, Cray Research, Inc., Digital Equipment Corp. and IBM mainframe configurations. Individual programs and extended solution packages are offered within the disciplines of finance, engineering, energy, distribution and manufacturing.

Service is available in two options. Option A base connect charges are \$10.50/hour with terminal I/O costing 21 cents per 1,000 characters. Service unit charges are 31 cents per service unit.

Option B base connect charges are \$15.50/hour with terminal I/O cost-

ing 27 cents per 1,000 characters and a 22 cents charge per service unit. The vendor can be contacted through P.O. Box 8551, Kansas City, Mo. 64114.

'Datacalc/38' Offered By Fusion Products

MILL VALLEY, Calif. — Fusion Products International has announced Datacalc/38, a financial modeling and electronic spreadsheet system written in RPG III for IBM's System/38. It is said to allow users to create large three-dimensional models with 97 lateral columns, 10,000 vertical rows and 9,999 spreadsheets per file.

When directly interfaced to the System/38's Data Description Specification, any Datacalc/38 spreadsheet reportedly can be updated automatically. Features include real-time extraction, multilevel menu command console, full spreadsheet consolidations, the 42 Single Key Formula Library, Help screens and a hands-on tutorial program.

Datacalc/38 costs \$4,500 from 317 Miller Ave., Mill Valley, Calif. 94941.



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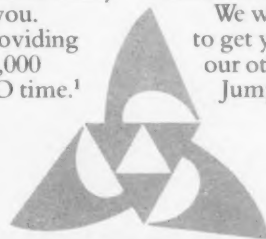
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Window is the name of a full-screen text editor designed for IBM Personal Computer users. Editing functions include scroll, lock, insert, delete, page-up and page-down capabilities. The software diskette costs \$150 and is available from Intellect Associates, Inc. through P.O. Box 365, Holbrook, N.Y. 11741.

Satellite Software International offers two new products for the IBM Personal Computer. **Wordperfect** is a word processing package featuring merge, math, columns and printer support. It costs \$495. **SSI Forth** is

the company's version of the Forth programming language, which sells for \$95. The vendor is based at 288 W. Center St., Orem, Utah 84057.

CMA Micro Computer has announced the release of a new Basic teaching and IBM DOS training program for the IBM Personal Computer. **The Teach PC** runs on IBM's Personal Computer and leads the user through Basic, utilities and various fundamental computer operations. It costs \$149.95, the vendor said from 55722 Santa Fe Trail, Yucca Valley, Calif. 92284.

Three programs for use with the Profile Plus electronic filing program for the TRS-80 Model II microcomputer were introduced by Radio Shack. **Profile Prosort**, available for \$149, was described by the vendor as a high-speed indexing program that permits sorting and selecting records from any segment of a file. **Profile Forms**, a print program that prints one report per sheet on each item in the file, is priced at \$125. **Profile Archive**, which allows the user to purge inactive records from any file in Profile Plus, is available for \$49. The vendor is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

Technical Systems Consultants, Inc. has released a native code Cobol compiler for use under its Motorola, Inc. microprocessor-based Uniflex operating system. A single-CPU license for the complete 6809 **Uniflex** Cobol package costs \$750, which includes one year of maintenance and a limited warranty, the vendor said from 111 Providence Road, Chapel Hill, N.C. 27514.

Cullinet Opens Center

WESTWOOD, Mass. — Cullinet Software, Inc. has opened its National Education Center at 30 Speen St. in Framingham, Mass. The center will provide hands-on training on Cullinet products as well as for such functions as data base administration, data communications administration, applications design and applications programming.

The center includes a computer laboratory with the entire base of Cullinet products installed. The laboratory will provide compatible environments for students familiar with different operating systems, including OS, MVS and DOS/VS.

Cullinet can be contacted at 400 Blue Hill Drive, Westwood, Mass. 02090.

Package Out For Board Testers

CONCORD, Mass. — Genrad, Inc. has announced a program development package for Genrad's 227X line of circuit board testers used in conjunction with Digital Equipment Corp.'s VAX-11 series processors.

Called VAX/227X, the package is compatible with 227X Release 7 software. Features include the ability to create a complete test program including circuit analysis and use of component libraries. The package is menu driven and can be used in multitasking applications.

The VAX/227X program will run on any VAX-11 processor. The package costs about \$25,000, the vendor said from 300 Baker Ave., Concord, Mass. 01742.

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Cableshare CPU Now Compatible With RSX-11M

LONDON, Ontario — Cableshare, Inc. has announced that its LSI-X.25 front-end processor can now be used with Digital Equipment Corp.'s RSX-11M V4.0 and RSX-11M Plus V2.0 operating systems.

Designed for operation with DEC PDP-11 and VAX series processors, the LSI-X.25 can tie DEC processors to public and private packet switched networks. The unit is equipped with a direct memory interface to a host processor and eliminates the need for communications port hardware. All three levels of the X.25 communications protocol are supported, the vendor said.

The LSI-X.25 costs \$13,250, a spokesman for the vendor said through P.O. Box 5880, 20 Enterprise Drive, London, Ontario N6A 4L6.

Supports Non-HP Terminals

Tymlabs Aid Targets HP V/3000

AUSTIN, Texas — Tymlabs Corp. has introduced a communications software package said to allow the Hewlett-Packard Co. V/3000 Form Facility package to run on any CRT terminal.

Preview allows the V/3000 — designed to run on Hewlett-Packard display terminals in block mode — to run under character mode on less expensive terminals, a vendor spokesman claimed. Heavy I/O demands common to block mode are said to be reduced in character mode.

Among the terminals supported by Preview are the Lear Siegler, Inc. ADM 3A and ADM 5; Tele-Video Inc. 925, 950 and 970; and IBM 3101.

Autodial Modem Announced

SAN JOSE, Calif. — Anderson Jacobson, Inc. has unveiled an auto-dial modem said to eliminate the need for a telephone set on the data line.

Terminal users may dial direct from any associated terminal keyboard, as well as enter, store and automatically dial up to 10 telephone numbers through simple keyboard commands, according to the vendor.

The AJ 1259-AD is an auto-dial/auto-answer triple modem compatible with the

Scott Systems Announces Intelligent Terminal Line

MARLBOROUGH, Mass. — Scott Systems, Inc. has unveiled Access, a multifunctional intelligent terminal product line based on Intel Corp.'s 8088 microprocessor and said to embrace a range of capabilities from simple terminal emulation to advanced local- and wide-area network systems.

Principal components of the product line reportedly include clustered and stand-alone terminals, an extensive library of emulators and applications programs and supporting software tools. The local-area network software operates under the direction of the Scott Environment Management System.

The minimum Access terminal starts with 64K bytes of memory expandable to 1M byte, the vendor said. The product line

utilizes an industry-standard bus architecture. Each terminal is configured to include two microprocessors: one to execute the applications program and the other to support network communications.

The Access product line is functionally divided into four dimensions and the equipment and software migrate through each dimension:

• Dimension I — The Access stand-alone or cluster systems reportedly will emulate a wide range of popular terminals including IBM's 3270/Binary Synchronous Control, 3270/Synchronous Data Link Control (SDLC) and Systems Network Architecture/SDLC; Digital Equipment Corp. VT-100; Burroughs Corp. TD 830; and the Sperry Univac U200.

• Dimension II — The Access system is said to integrate all the necessary hardware and software to act as a stand-alone or clustered independent workstation system, including Access disk drives and up to 1M byte of main memory.

Each Access workstation can control a wide range of peripherals. Disk units enable the Access stand-alone terminal to function as a personal computer, according to the vendor.

(Continued on Page 48)

Protocol Conversion Package Provides IBM 3278 Emulation

OTTAWA — Aztec Computing, Inc. has announced protocol conversion software said to link microcomputers and asynchronous terminals to IBM mainframe computers and have them appear as local IBM

3278 terminals.

The SIM3278 package reportedly provides for the full-screen functions of an IBM 3278, while using an inexpensive Ascii video display terminal, without any hardware or operating system modifications or additions. Up to 255 terminals per simulator and over 30 different terminal types can be supported by the emulation system, which uses IBM 370 assembler language.

Also, existing 3278 full-screen software can be used by both micros and dumb terminals without modifications to the VM/SP operating system, the vendor said.

SIM3278 costs \$5,500 per single-CPU license. A 30-day, free demonstration tape is available. Aztec Computing is located at 969 Bronson Ave., Ottawa, Ontario, Canada K1S 4G8.

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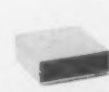
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Features ROM-PAC Field Test System Debuts

LINCOLN, R.I. — International Data Sciences, Inc. (IDS) has announced a system for uploading and downloading data communications test routines between a host site and field locations. The software was designed to operate with the IDS Hawk Model 4030 Programmable Datacomm Tester and is offered in a compact plug-in read-only memory module, ROM-PAC.

IDS also announced the addition of a portable, self-contained data test set to its Range Rider product line of

data communications test equipment.

The Model 4030 is said to be a lightweight field service data communications test instrument featuring 51 resident instructions for developing user-unique test routines of up to 100 steps each. ROM-PACs are now available for X.21 test routines and IBM's Binary Synchronous Communications and Systems Network Architecture.

The Model 1320 Range Rider data test set was designed to analyze the error rate of any digital transmission network. It reportedly can be used to test synchronous, asynchronous or start/stop character-oriented systems such as time-division multiplexers (TDM). Bit, character and block error rates are determined by transmitting pseudo-random test patterns over the communications channel. Also, a start/stop character can be programmed and transmitted in either a single or continuous format, the vendor said.

The Model 1320 TDM-Modem Test Set is priced at \$4,145 from International Data Sciences at 7 Wellington Road, Lincoln, R.I. 02865.

Controller Bows From ETI Micro

DUBLIN, Calif. — ETI Micro has introduced a communications controller said to be Multibus-compatible operating in a multiple board system or as a stand-alone controller.

The 8103 Smart Communications Controller contains two RS-232C ports, two Bell 202 modems, a microprocessor, dual-port random-access memory and two levels of preprocessing firmware. All routines for servicing and handling four separate communications lines simultaneously reside within the on-board preprocessing firmware, a vendor spokesman claimed.

The 8103 is available for a base price of \$1,160 from ETI Micro, 6918 Sierra Court, Dublin, Calif. 94568.

Guide Covers Equipment Info

PENNSAUKEN, N.J. — Auerbach Publishers, Inc. has introduced a two-volume guide said to provide current information on the selection of telecommunications equipment and call management.

Designed for telecommunications executives, the "Telephone Equipment Selection Guide" includes "how to" techniques on qualifying vendors, requesting proposals and negotiating contracts. The "Telephone Cost and Call Management" guide allows the user to evaluate his current systems and design, implement and maintain the best system for his company, according to a vendor spokesman.

Individually, the volumes are \$180 each; purchased together the price is \$320. More information is available from Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109.

Converter Out For IBM 5520

HOUSTON — IO Corp. has unveiled an IBM 5520-compatible interface that reportedly links the 5520 with an asynchronous device using IBM's Binary Synchronous Communications (BSC) protocol.

The protocol converter reportedly has been sensitized to only pass message data as input by the word processing operators using the 5520. It features an 8K-byte memory, utilizes BSC error checking to ensure data integrity and interfaces a 24K bit/sec BSC line to a 12K bit/sec asynchronous line.

The IO901A interface costs \$39.95 and can be leased. IO Corp. is located at 1343 Blalock, Houston, Texas 77055.

System/34s, 38s Get Data Transfer Aid

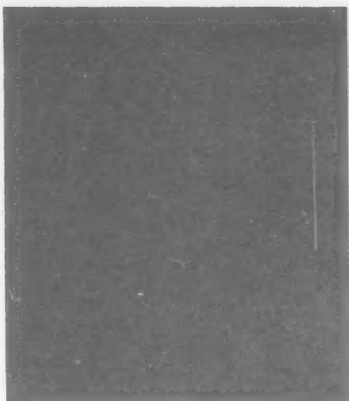
ST LOUIS — Data Transfers has introduced a communications software package said to allow transmission of data between multiple IBM System/34s and an IBM System/38.

Data-Trans/1 allows the transfer of reports contained in spool queue, data files and punch data. It also maintains a history of files received and sent and files can be sent in transparent mode or block size to 8,196 bytes. It utilizes the Binary Synchronous Communications protocol, a vendor spokesman said.

The package is available for \$990, the spokesman said from Data Transfers, P.O. Box 28553, St. Louis, Mo. 63141.

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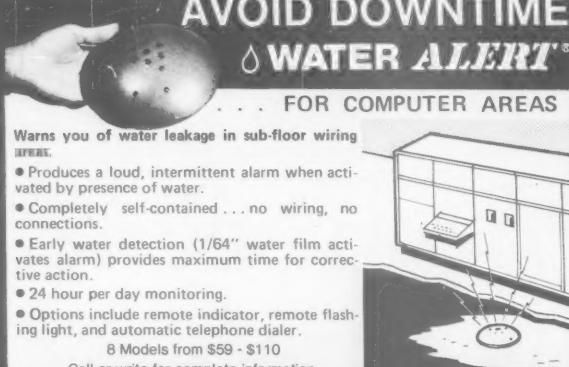
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Local Networking Capability Featured With Intecom PBX

ALLEN, Texas — Intecom, Inc. has integrated local-area networking into its IBX private branch exchange (PBX).

Lanmark is a 512K bit/sec network inherent to the IBX architecture. All communication — voice and data transmission between devices at high and low speeds — takes place with the large 8,192-port IBX Lanmark, the vendor claimed. The family of Lanmark applications is scheduled to be brought out in phases: A Xerox Corp. Ethernet application is available now.

The PBX uses a single cable plant of twisted-pair cabling to provide voice and data circuit switching plus

network packet switching. The list of telephone features includes voice synthesized instructions and least-cost routing. The IBX also interfaces devices with data transmission at up to 10M bit/sec to support the workstation environment, the vendor claimed.

Lanmark costs \$500/user interface and \$10,000 as a basic option to the IBX. All existing IBXs can be retrofitted to utilize the local-area networking capability, Intecom said from 601 Intecom Drive, Allen, Texas 75002.

AED Cuts Prices On Terminals

SUNNYVALE, Calif. — Advanced Electronics Design, Inc. (AED) has announced a more than 50% price cut for its AED512 and AED767 color graphics terminals.

The AED512 tabletop terminal with eight memory planes now costs \$5,995. The AED767, said to be the first display to incorporate antialiasing features into firmware, is now priced at \$10,995.

AED's pricing strategy is the result of substantial savings in manufacturing costs as well as an 80% rise in sales during 1982, the vendor said from 440 Potrero Ave., Sunnyvale, Calif. 94086.

Smart Terminals Bow From Scott

(Continued from Page 45)
 ing to the vendor.

- Dimension III — Up to 32 Access systems with a maximum 60 workstations are incorporated into a local-area network with each system capable of sharing the resources and communicating within the network.

- Dimension IV — Up to 32 local-area networks are linked into a wide-area network with over 1,000 Access systems communicating independently of the host computer to provide a full range of application support and interface to other networks, electronic mail and internetwork communications.

The network capabilities support a local network via high-speed network interface adapters and a wide-area network via Gateway controllers. Baseband signaling is used with a data transmission rate of 1M bit/sec. The local-area network utilizes coaxial cable up to 5,000 feet in length, the vendor said.

The basic small cluster system including 64K-byte memory, 16K-byte erasable programmable read-only memory, CRT screens and keyboards is priced \$2,473/position. Diskette device prices begin at \$3,225 for a dual 5¼-in. drive.

Larger clustered configurations start in price from \$1,970/position. Maintenance is provided by Scott Systems through a nationwide service organization, the spokesman for the vendor said.

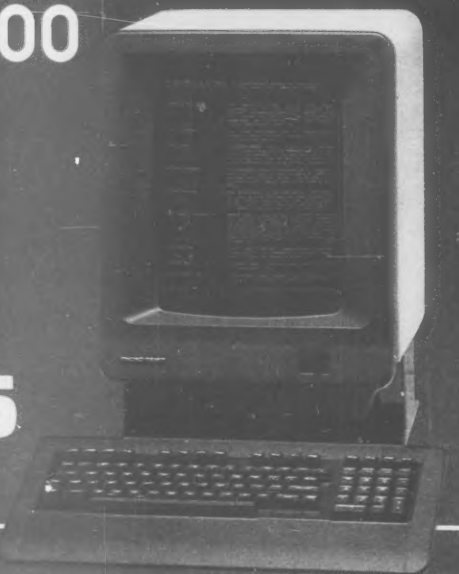
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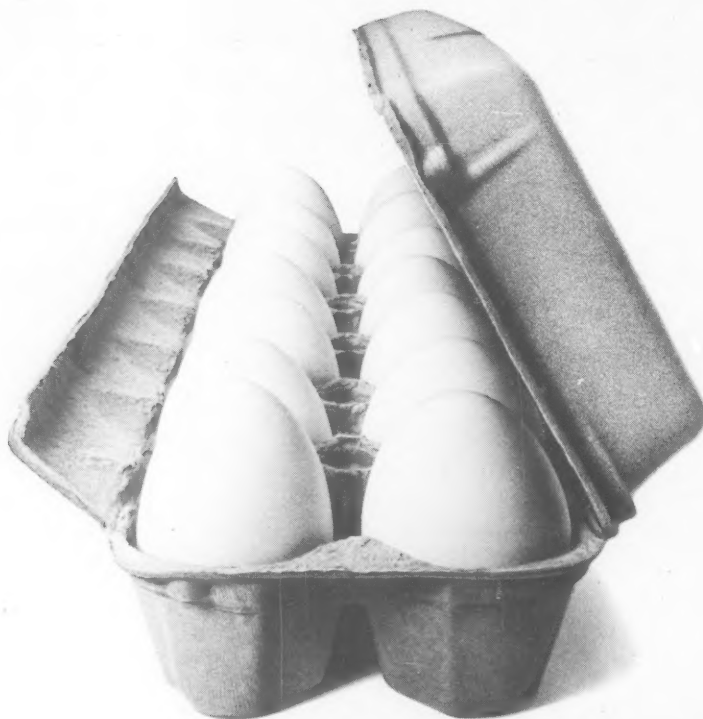
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IN DEPTH

Tax Breaks On Software

By Jan Lee Ozer

Dear Tax Adviser:

As data processing manager of XYZ Corp., I convinced the financial people to commit substantial resources to developing and acquiring computer software needed to continue experimentation into new product lines. But ever since year-end, I have been getting funny looks from everyone in the accounting department. Apparently our cash position is not as strong as anticipated due to the poor economy. You are my last hope. Do you have any tax miracles that go right to the bottom line?

— Alienated

Dear Tax Adviser:

As my company's management information systems director, I have been asked to submit a proposal to the finance committee for software expenditures for the next three years. My predecessor's pro-



IN DEPTH

posals were strong on DOS/VS, OS, remote job entry emulators and data base management systems, but weak on anything the committee members could understand. Hence, his budget was al-

ways small — ultimately too small for his salary. I would like some tax planning tips to integrate into my proposal. In short, how can I use the tax laws to make the necessary expenditures as inex-

pensive as possible?

I also bought a personal computer for my own use last year. I use the machine to manage my investment portfolio, to keep track of my tax situation and to help with

my company work at night and on weekends. Any tips?

— Ambitious

Dear Ambitious and Alienated:

You are not alone. With

data processing costs increasing in both dollar amount and as a percentage of the overall corporate budget, managers have a responsibility to consider all facets of finance, including how the tax laws can be used to their advantage.

Several recent developments have created new avenues for tax planning from which your company may benefit. Discussing these ideas with your financial people could lead to immediate savings on your 1982 return.

By including these concepts in your budget proposal, you could lower your company's anticipated out-of-pocket costs.

The recent developments involve two tax credits that may now be available for the cost of developing or acquiring software: the research tax credit, which was enacted by the Economic Recovery Tax Act of 1981 (Erta), and the investment tax credit, which was reinstated in 1971, but only recently made applicable to software. These credits constitute "bonus-like" tax incentives granted by Congress to encourage specific research or investment activities. As with all such tax incentives, the guidelines for the credit are fairly specific and are narrowly interpreted by the Internal Revenue Service.

Research Tax Credit

Erta enacted a tax credit for 25% of qualified incremental research and development expenditures paid or incurred after June 30, 1981, and prior to Jan. 1, 1986. To compute the incremental R&D costs, subtract from current-year costs the greater of actual base period costs or 50% of current-year costs. This limits creditable expenditures to a maximum of 50% of current-year costs, which reduces the 25% credit to a maximum of 12.5% of total expenditures for the year. The credit is further reduced when base period expenditures exceed 50% of current-year costs.

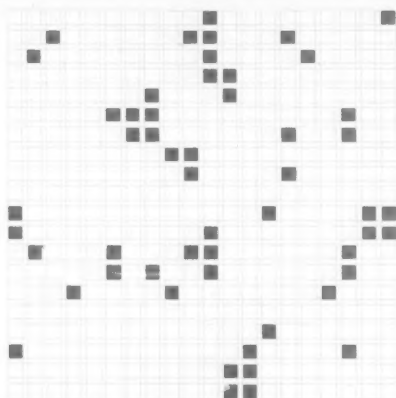
If the base period amount exceeds total current-year costs, then no credit is available.

Erta does not specifically define which software costs constitute R&D expenditures. The IRS recently proposed regulations specifically addressing this issue.

According to the proposed

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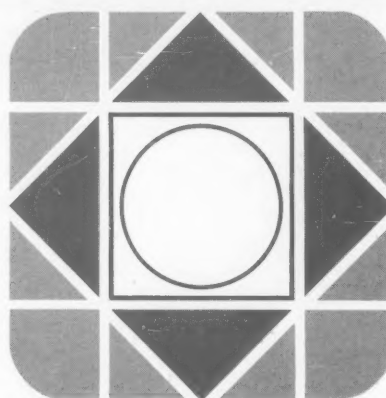
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We have witnessed dramatic improvements in hardware technology, but neither the supply of software developers, nor software development techniques, have kept pace. While many piecemeal solutions to the problem of systems development are present, they have, in fact, added to the problem.

The result has been a broadening awareness in most Information Systems groups that the corporate productivity challenge cannot be met without dramatic improvements in system development techniques and tools.



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IN DEPTH

regulations, "the term 'research or experimental expenditures' ... includes the programming costs paid or incurred for new or significantly improved computer software. The term does not include costs paid or incurred for the development of software the operational feasibility of which is not seriously in doubt.

"The costs of modifying previously developed computer software programs, such as the costs of adapting an existing program to specific customer needs or the costs of translating an existing program for use with other equipment, do not constitute research or experimental expenditures. Whether software is 'new or significantly improved' will be determined with regard to the computer program itself rather than the end use of the program.

"For example, the costs of developing a program to perform economic analysis which involves only standard or well-known programming techniques are not research or experimental expenditures even if the economic principles embodied in the program are novel. However, if the programming itself involves a significant risk that it cannot be written, the costs of developing the program are research or experimental expenditures regardless of whether the economic principles or formulas embodied in the program are novel," according to the proposed regulations.

The proposed regulations focus on the "operational feasibility" of the software rather than its end use. Unless the developmental process involves a significant risk of failure, the software costs would not fall within the IRS guidelines. This apparently excludes all software systems that are commercially available, even if installation would involve significant customization or modification.

Pure research into new programming techniques, such as research performed by software manufacturers, should qualify if it is within the other provisions of the credit. Software designed for a specific user function should qualify if new programming principles are used and if there is significant risk that the program will fail.

The definitive sections of the proposed regulations fall short in two areas. First, under the proposed guidelines, a program that is ultimately successful is almost by definition excluded, since its success may negate the probability of failure actually involved. Second, the proposed regulations would exclude software used in other qualifying R&D activities.

If XYZ Drug Corp. developed a simple program to aid in research of new drugs, the cost of the program would not qualify, even though virtually all other research expenses would. This seems excessively restrictive in view of the intended incentive purpose of the R&D credit.

Some expenditures incident to in-

stalling and implementing a software package may also be creditable under the research tax credit provisions. Such costs would include 100% of in-house expenditures for staff and supplies and 65% of outside consulting services. The sum could prove considerable during the process of installing a software system. Presumably, however, such costs would not be creditable unless the underlying software qualified as R&D. So, the restrictive provisions

have a cumulative effect by limiting the credit on not only the software costs, but on all costs associated with its implementation.

The regulations will not become final until after public commentary, and hearings will be held in late March. Because of the restrictive nature of the proposed regulations, a critical response is expected [see "Software R&D Tax Credit Rocky," CW, Feb. 21]. Furthermore, if the regulations were to be challenged in

court after their adoption, their validity might not be resolved for years. However, until withdrawn, modified or struck down by a court, they represent the IRS position with respect to software costs that qualify for the credit.

As would be expected, there is significant gray area between software that clearly qualifies and software that clearly does not. The proposed regulations merely provide an outline of the factors to be used by the

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TAX BREAKS

In Depth/4

IN DEPTH

Assume a \$100,000 expenditure for software in the year ended Dec. 31, 1982 and that the expenditure qualifies for the research and development credit. Assume also that there were no research and development expenditures in the prior year. The credit would be calculated as follows:

Qualified research and development expenditures	
65% of \$100,000	\$65,000
Base period expenditures (greater of actual or 50% of current costs)	32,500
Excess of current over base period	32,500
Credit percentage	X 25%
Research and development credit	\$8,125
Effective credit rate 8,125/100,000	8.125%

Figure 1. Calculating the Research and Development Credit

IRS in distinguishing creditable software. Knowledge of these factors will help identify software that may qualify for the research tax credit. Once that software is identified, discussions with in-house financial or tax personnel should be instituted to determine whether the credit is applicable. If so, the company should identify and account for other creditable expenses incident to the software development in order to ensure that the company obtains the maximum allowable credit.

Investment Tax Credit

The investment tax credit is a credit on investment in qualified

personal property. Unlike the research tax credit, the investment tax credit is not based on incremental expenditures, but is calculated yearly without regard to expenditures in previous years.

Traditionally, the investment tax credit has only been available for software that was purchased with the original hardware — and only if the invoice did not state the software costs separately. All internally developed software and all software purchased after the hardware was not considered property eligible for the investment tax credit.

The Fifth Circuit Court's decision in *Texas Instruments, Inc. vs. U.S. cast*

Research and Development Costs	Option I	Option II	Option III
12/31/81	\$ 25,000		\$ 75,000
12/31/82	125,000		75,000
12/31/82		\$150,000	
Total expenditures	\$150,000	\$150,000	\$150,000
Total research and development credit	\$ 12,188	\$ 12,188	\$ 6,094
Investment tax credit	\$ 12,000	\$ 12,000	\$ 12,000

Figure 3. Assume no R&D software costs incurred in 1980.

some favorable light in this area. In that case, the taxpayer sought to capitalize the costs of processing seismic data onto computer tapes for producing maps of undersea terrain. The capitalized costs included labor, materials and other expenditures, as well as the purchase price of the magnetic tapes. TI claimed investment tax credit on the total amount capitalized. The IRS asserted that the costs of collecting and processing the data were an investment in intangible property and that the investment tax credit was limited to the minimal cost of the tape.

The court ruled that the total capitalized cost was eligible for investment tax credit. While recognizing that the intrinsic value of the tapes related to the information contained

thereon, the court reasoned that the information had no value unless manifested in some tangible, useful form. The court concluded, therefore, that the tangible and intangible components of the tapes could not be separated and that the entire cost was eligible for investment tax credit.

Like the magnetic tapes in the TI case, software has no commercial application without physical manifestation for input into the computer. For this reason, many tax professionals have been advising their clients to claim the investment tax credit on both purchased and internally developed software.

Purchased Software

As discussed earlier, most purchases of packaged software will not

Research and Development Software Expenditures	Investment Credit ¹	Research Tax Credit
Year ended 12/31/81 \$100,000	\$ 8,000	\$ 8,125
Year ended 12/31/82 100,000	8,000	8,125
Year ended 12/31/83 100,000	8,000	5,417
Year ended 12/31/84 100,000	8,000	Nil
Year ended 12/31/85 100,000	8,000	Nil
Total Credits	\$40,000	\$21,667

1. Assume election was made in all years to reduce the investment tax credit by 2%.

Figure 2

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SALES FORECAST FOR 1983		UNIT COST	Jan	Feb	March	April
PRODUCT	CODE	Net	Net	Net	Net	Net
Widgets	A45	50,123	5819	5868	5898	5927
Gadgets	S76	.031	9963	9963	9963	9963
Hatchets	009	16,785	19	20	22	25
Flea Flickers	Q234	5,980	1382	1313	1247	1185
Knee Knickers	H-90	19,979	2106	2106	2106	2106

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SALES FORECAST FOR 1983		May	June	July	Aug	Sep
PRODUCT	CODE	Net	Net	Net	Net	Net
Widgets	A45	5957	5987	6017	6047	6077
Gadgets	S76	9963	9963	9963	9963	9963
Hatchets	009	30	33	37	40	43
Flea Flickers	Q234	1125	1069	1016	965	917
Knee Knickers	H-90	2106	2106	2106	2106	2106

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IN DEPTH

qualify for the R&D credit. However, investment tax credit should be claimed for software purchases, whether they were made separately or with hardware.

Contract Expenditures

Contract expenditures for software programs specifically designed for a user's needs should qualify for the R&D credit if the qualifications discussed previously are met. However, only 65% of contract research expenses, or fees paid to third parties for R&D, is treated as a qualified research expenditure. When coupled with the definition of minimum base period expenditures, this limits the effective credit to a maximum of 8.125% (see Figure 1).

To compare this result with the investment tax credit available on the same expenditure, the provisions of the Tax Equity and Fiscal Responsibility Act of 1982 (Tefra) must first be examined. Under Tefra, the purchaser of property eligible for investment tax credit has two options. Using the general rule, a 10% credit applies, but the depreciable basis of the property must be reduced by 50% of the investment tax credit taken. This, of course, reduces the tax benefits to be derived from the depreciation of the property.

If this general rule were followed in the example in Figure 1, the investment tax credit would be \$10,000 and the remaining depreciable basis of the property would be \$95,000. The alternative, which results in more overall tax savings, is to reduce the credit by 2%. This would result in an investment tax credit of \$8,000 and a depreciable basis of \$100,000.

If that choice is made, the absolute credits for purchased software are roughly equivalent (compare the 8.125% R&D credit with true 8% investment tax credit). Two factors, the flow of software expenditures and the extent of in-house research and development expenses, must be analyzed to determine which route will yield the maximum tax saving.

While the investment tax credit is available each year without reference to prior year expenditures, the research tax credit is based on incremental expenditures only.

For this reason, if a company anticipates a steady

flow of software expenditures over several years, the investment tax credit yields more favorable results (see Figure 2).

If contract software development costs can be incurred

in one year, or in yearly increments of 100% of base period costs, maximum use of the research tax credit can be attained (see Figure 3).

In planning when to make these expenditures, users

must consider the prepayment provisions contained in Erta. These provisions allow the IRS to allocate contract expenditures to the period during which the services were performed,

thus frustrating a prepayment scheme designed to maximize the research tax credit.

The second factor that must be analyzed is in-house expenditures relating to soft-

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IN DEPTH

Assume that \$100,000 is spent for internal software development in the year ended Dec. 31, 1980 and all other years shown. This example traces the tax benefits of the \$100,000 expenditure in the year ended Dec. 31, 1981, comparing the results obtained by expensing or capitalizing the costs. Assume that tax savings were invested in the year following realization. Results would be identical for expenditures in all other years.

Year	Expense ¹	Tax Benefits ³ Capitalize ²
Dec. 31, 1981	\$46,000	\$16,555
Dec. 31, 1982	Nil	9,614
Dec. 31, 1983	Nil	9,177
Dec. 31, 1984	Nil	9,177
Dec. 31, 1985	Nil	9,177
Total tax savings	\$46,000	\$53,700
Interest earned ⁴	\$21,349	\$13,710
Total benefit	\$67,349	\$67,410

1. Assume no R&D credit due to lack of incremental qualifying expenditures.
2. Assume that property was depreciated using five-year ACRS and that the depreciable base was reduced by 5% of the investment tax credit claimed.
3. Assume 46% rate in all years.
4. Assume 10% yield.

Figure 4

ware development. As noted above, installing a computer can involve a significant amount of staff time, and it is not unusual for a company to hire several people to help. Assuming the underlying software qualifies as R&D, these costs would also qualify in full for the R&D credit.

To summarize, some software purchases will not qualify for the new R&D credit, but support exists for taking the investment tax credit on them.

For software purchases that qualify for both credits, the flow of those purchases and extent of in-house expenditures should be estimated. Once these figures are obtained, the taxpayer should forecast the total credits under each alternative before choosing characterization as personal property or R&D expenses.

Internally Developed Software

Both credits discussed above should be available for internally developed software. However, if the software costs are claimed as R&D expenditures, the credit may be obtained and all of the costs can be written off in that year. If the investment tax credit is claimed, the costs must be capitalized and depreciated, resulting in a five-year write-off of software costs. This difference alone seems to distinguish the claiming of these expenses as R&D costs as preferable.

However, the R&D credit is only available until Dec. 31, 1985, and is based on incremental expenditures. If a corporation incurred yearly R&D costs without significant increments,

the research tax credit would be minimal.

In this instance, the relevant analysis compares the tax deferral from the immediate write-off of development costs with the overall tax benefit of claiming investment tax credit and depreciating the property over five years. If the tax savings from the first year's write-off can be invested at an overall yield in excess of 10%, treatment as R&D expenditures provides a better result. If this yield cannot be obtained, capitalization would be more beneficial when considering both total tax savings and the time value of money (see Figure 4).

Notwithstanding the analysis above, most corporations incurring internal software development costs will probably continue to elect the immediate write-off, largely because of the current emphasis on immediate cash flow.

This analysis presupposes that software costs, in some instances, can be characterized as either R&D expenditures or as amounts spent to acquire a tangible asset. Some support now exists for each type of treatment, but the ultimate characterization of software will not occur for several years. In view of the uncer-

tainty, the wisest course is to determine which approach yields the maximum tax benefit and to use that approach consistently.

Personal Computers

The cost of a home computer is deductible to the extent that:

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About the Author

Jan Lee Ozer is a tax accountant with Deloitte Haskins & Sells in Atlanta. During his three years in public accounting, he has developed a special interest in the area of tax planning for software development and acquisition.

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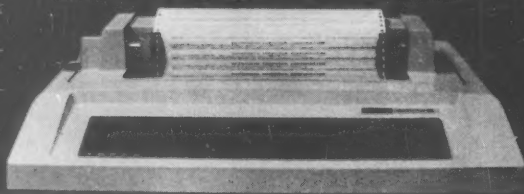
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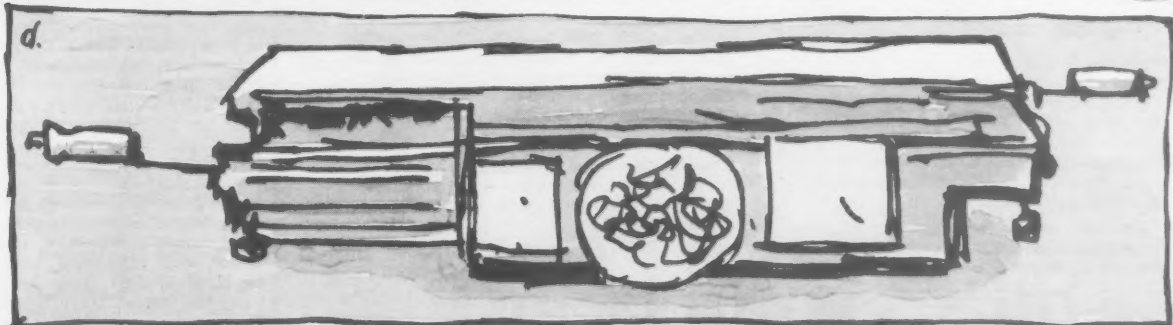
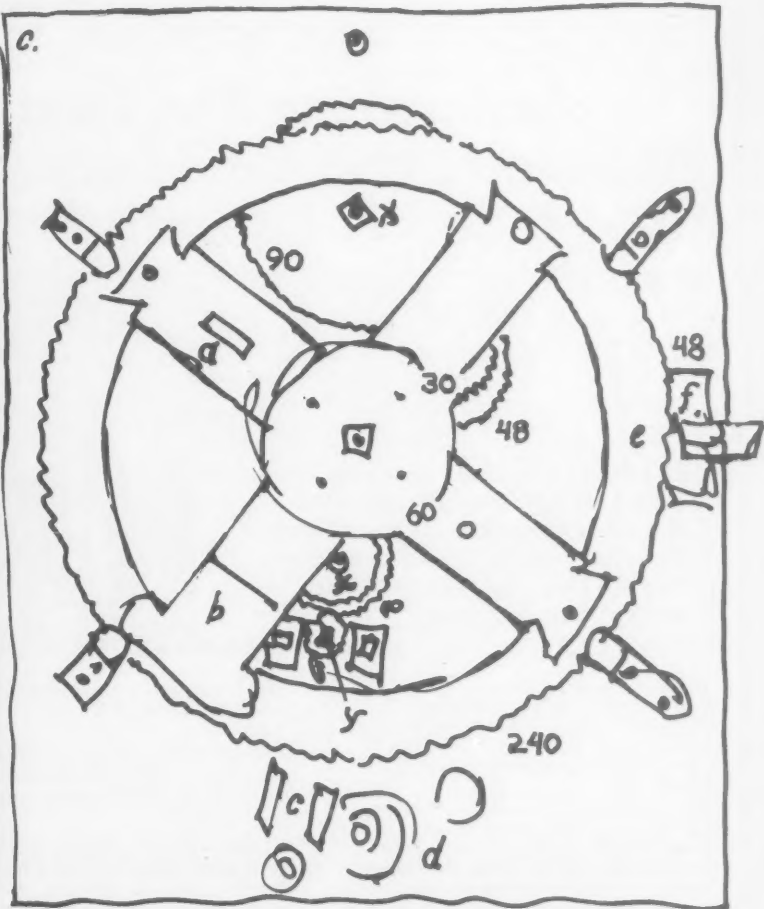
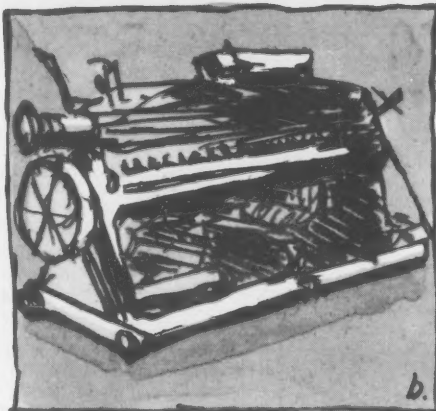
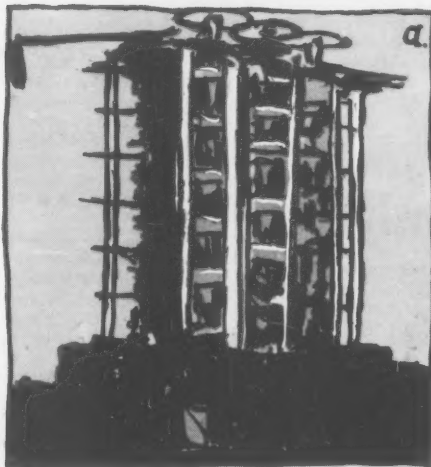
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INFORMATION SYSTEMS ENGINEERING

By Terry Goodbody

Change has become the norm in developing information systems, but the data processing community too often approaches change with a "wait-and-see" strategy. DP departments can no longer afford to rely on old, proven development methods and work without an organizational standard that provides enough flexibility for applying new technologies.

The business community has further complicated the wait-and-see strate-



a. Babbage's Difference Engine b. Bollee's Multiplication Machine
c. Diagram of a First Century B.C. Astronomical Computer d. The Leibniz Calculator

IN DEPTH

gy by becoming educated in DP and searching for new information solutions. Home computers and distributed processors can easily be purchased by any major department of the corporation and the cost hidden from DP. If such ventures bring results, the DP community will find it difficult to take away a proven business solution to an information problem.

Over the last 10 years, business has been reluctant to wait for results.

New technology forced DP, in many instances, to create information systems with shorter development time frames just to maintain control. DP has had to rely on crisis management (fixing systems as a result of bad architectural design), as opposed to giving any thought to how to construct better information systems given the changing environment.

Information systems engineering is a concept that provides the organizational game plan. It outlines re-

sponsibilities for the architectural drawings, the engineering for each component, the map of the environment and the configuration plan in constructing an information system.

In addition, information systems engineering supplies two concepts in order to balance the overall approach to information systems architecture: information resource management and a standard environment. These two concepts are combined within one organization.

Today's systems development tools must be better managed to take advantage of a total information system development strategy. Understanding how to use these tools will result in better management, faster development life cycles, complete data understanding and a well-executed DP organization with clear-cut lines of responsibility.

Information systems engineering focuses on four areas:

- **Environmental management** protects the application dollar investment of the corporation by providing "middleware" between the application program and the technology, establishing a standard. This allows the corporation to benefit from new technology with a minimum of application redevelopment investment.

- **Configuration management** provides the organization with a planning, modeling and reporting function, incorporating all components of DP into one integrated plan that is revised daily to facilitate immediate management decisions.

- **Data management** documents all components of the DP environment in detail and provides an independent flow of information that enhances the application processes, but does not confine them to the location of the data or the data base structures.

- **Information management** enhances the access of user requirements beyond the application systems by providing the tools necessary to access information and control the request and the education necessary to understand the condition of the data or information systems.

Environmental Management

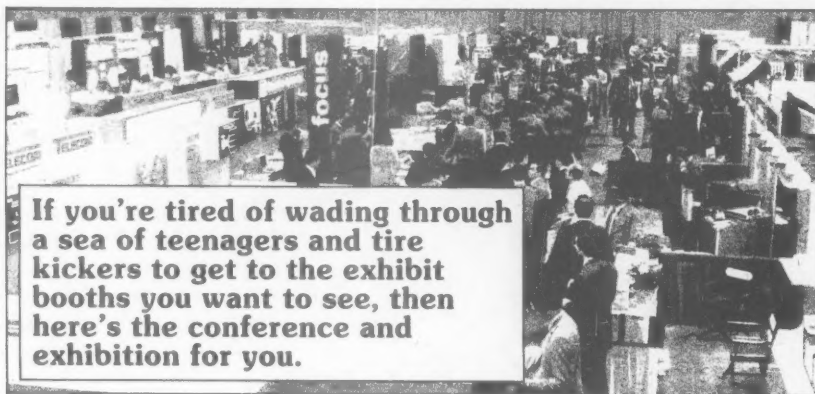
Environmental management is an organization that addresses change and manages that change so the DP community can be state of the art without being the "bleeding edge." It provides the method for making a technology decision today, with the ability to recover from a mistake tomorrow.

Through use of a "middleware" approach, environmental management establishes within DP a standard that is the foundation from which all information systems are built. However, the impact of change must first be understood from a DP organization's point of view. This understanding can determine which solutions to apply.

When examining possible areas of change, three major components can be identified in relation to systems development: business requirements, technology (hardware/software) and data. Change to any of these components will affect the others.

Business requirements. The information system is a group of functional processes that must be performed for a given business entity within the corporation. If we assume that the data is always available, as does

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IBM's Hierarchical Input/Process/Output (Hipo), then the system design approach becomes much easier. The Hipo approach implies that you get data from somewhere, process it and put it somewhere. "Somewhere" does not have to be defined in this systems design approach.

Hipo has become a proven approach in developing the information system. The important point, however, is that the business functions can be created and understood without regard to technology or the manipulation of data (input, output or stored).

Technology. It is the system software that dictates the impact of technology on a given information system. That software consists of four basic functional parts:

- The compiler that interprets into machine language the business requirement once defined via Hipo or some other method and programmed in Cobol, PL/I or another language.

- The operating system that affects the compiler in the interpretation of instructions to get at I/O devices (data).

- The on-line system that in most cases must communicate with the application programs via a call in order to pass data.

- The data base management system (DBMS) that controls the stored data and must be communicated with in order to access that data.

Data. Data further affects the information system beyond the technology in the way that it is input, output or stored. When technology changes, data will be affected. For example, if the DBMS is upgraded to a relational data base system, the information system must change in order to obtain data via another instruction set or another data structure.

The construction of the information system itself can affect the way in which data has an impact. This type of impact occurs through the use of constant data. If the programmer includes a chart of accounts within the information system and the chart of accounts changes, then every program containing this data must change.

In fact, all software is a result of the need to obtain data. Data becomes embedded within the system software and, as a result, becomes

'Information systems engineering is a concept that provides the organizational game plan. It outlines responsibilities for the architectural drawings, the engineering for each component, the map of the environment and the configuration plan in constructing an information system.'

part of the changing environment of data and technology.

This environment must be stan-

dardized in order to prevent the environmental changes from impacting the information system. The concept

of a standard environment as discussed here uses today's DP technology but results in better management of that technology. It consists of four components:

1. Data base I/O processing.
2. Telecommunications I/O processor.
3. General table I/O processor.
4. I/O processor.

These four components are the only way in which information systems access data. As a result, the in-

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formation system is protected not only from the data, but also from the changing technology (see Figure 1).

If the information system is isolated from the environment (data, software and hardware), changes can take place within any of the four components of the standard environment without affecting the information system, as long as the interface is maintained. The interface is nothing more than a group of elements (records) that are passed back and forth

to accomplish a given function within the information system. All data (input, output or stored) is passed in this manner. As a result, all changes in technology can be accomplished by modifying any one or all four standard environment modules, but no changes are made to the information system.

Information systems can be tested without affecting current development and transported to the new technology once the standard envi-

ronment has again been stabilized. All standard environment modules are throwaways: They are rewritten to handle technology changes. When change occurs, only four modules are rewritten, as opposed to hundreds of application programs.

Environmental management as an organization is responsible for maintaining this standard. New technology must first be examined for its impact on the information system and, as a result, a standard environment

module created to protect the information system from this new technology.

Standard environment enhances the DP organization and supplies the following benefits to information systems:

- Data access and manipulation can be understood by even the trainee programmer/analyst.
- The programmer/analyst is business-oriented, as opposed to technically oriented.
- DP now controls its migration plan to new technology.
- Efficiencies are built into the standard environment and are constantly fine-tuned.
- Only a small group of personnel must be educated in new technology.
- Budgets are greatly reduced within the information systems development area and thereby greatly reduced for DP as a whole.
- New technology is easy to manage and a contingency plan is always available.

Standard environment capitalizes on a good structured programming approach, establishing a standard for the entire DP organization. The initial reaction to the concept is that it is too complicated and unfeasible. This, of course, is a standard reaction to any new idea. In most cases, however, the staff within the DP environment has little if any real experience in new technology and must be trained. This training provides understanding at various levels and can result in many application programs being written poorly. It is often impossible to fine-tune poorly written programs without rewriting the entire program.

Standard environment allows the programmer to feel good about his solutions without worrying about whether or not he created a performance bottleneck. True technical employees can be transferred into environmental management, just as the project leader can have the most technically qualified personnel write the I/O routines.

Configuration Management

Configuration management is responsible for two functions within the confines of this organizational structure:

1. Architecture of data and information systems.
2. Configuration management of information systems, data, hardware and software, which consist of planning, planning support and management reporting.

Data Architecture: With the creation of a standard environment, the data is independent from the information system.

The data still remains tightly interrelated with the technology and is locked into the software that manages it. Data must be understood and, as a result, is confined and managed in order to support technology changes and information systems architectures.

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In the past, the length of time necessary to accomplish a complete information understanding at the enterprise level presented a problem. Studies with IBM's Business Systems Planning (BSP) have been recommended in order to accomplish this understanding. However, business needs are immediate and users may not be able to wait two to five years for a study to be completed.

One approach to this problem is to implement purchased information systems until the information study is complete and then reevaluate those systems based on the information model. However, even when the BSP has been completed, it is generally considered to be a tool for understanding information and cannot be implemented.

Through the use of data architecture, configuration management answers this problem by examining what DP does today.

Many DP organizations have divided information systems into functional areas: financial, human resources, manufacturing, merchandising and so on.

This approach has allowed a greater understanding of and commitment to the functions needed in each of the major areas, but it has clouded the data issue. An understanding of information systems relies heavily on knowledge of a given business function; however, an understanding of data relies most heavily on knowledge of the entire enterprise (all functions).

In order to better understand the data, various approaches have evolved, such as information engineering, information resource management and information modeling.

While these approaches are valid, most assume the information systems do not yet exist. But the real problem users face is how to deal with the information systems that are already in operation.

Once again, a standard must be established. Data can be likened to land in a site plan, with functions analogous to the houses. The land is designed with consideration to the house's function (pool, patio) and, as a result, the site plan is created. Once this site plan has been established, management decisions can be made.

Phase I of the development should start close to the access road, because the houses may not sell. Phase I would never start at the back of the site plan, because an access path (road) would have to be built. That kind of decision would be risky.

The point is, with the DP community, Phase I may be built anywhere on the site plan, because DP does not create the layout of the land (the data). This is not entirely DP's fault; in most cases, time is the problem.

This is not entirely DP's fault; in most cases, time is the problem.

The following steps are an alternative to understanding all information requirements, but this process takes approximately six months for a given functional area. Six months can be justified by explaining that this time is usually needed to do a master file design for an accounts receivable system. However, when the data architecture is completed, it will include all data bases for all functional systems in that area.

In addition, a stronger commitment is built if the goal is an integrated data base for finance or human resources. The user likes his

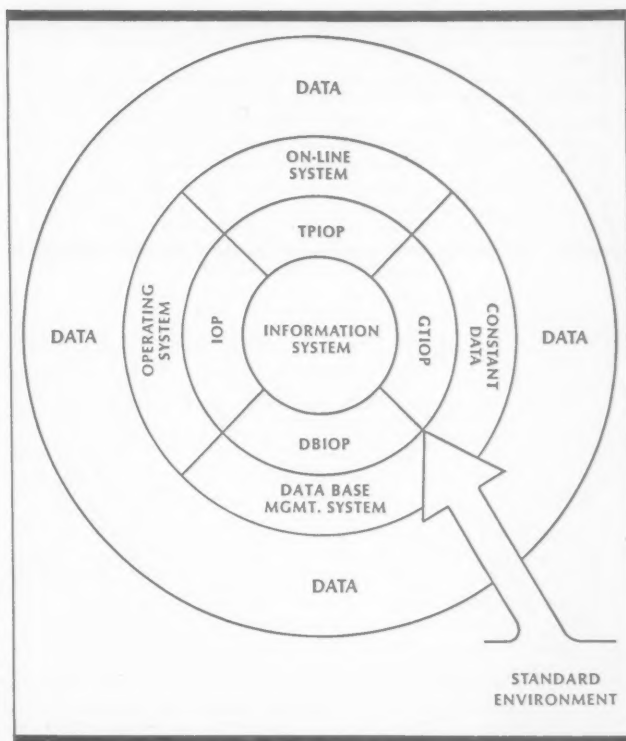


Figure 1

own data and so does the DP functional area. Once all integrated data bases have been set up for the enterprise, an additional link can take place to form a total enterprise information model.

Information Model

The job of setting up an information model should involve these elements:

- *Transfer team.* A team approach must first be established. The team

should include members from the information systems department with well-rounded knowledge of all systems within that functional area (finance, human resource, manufacturing and so on). It is best to start with finance, because in addition to the financial application, all systems have financial data impact and must be understood as well.

A user representative must also be part of the team, along with a senior data base analyst from configuration

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SYSTEM:									
Function	Volume	Element					Intent		

Figure 2. Transaction Matrix

management. A plan for the project must be established with a presentation of the events that will take place.

- **Transaction matrix.** The transaction matrix is prepared by major function for a given information system at the house level. In other words, it is an overview of the process (function) and elements (groups) to accomplish the process. The source of the transaction matrix is from a modified BSP study form.

In addition, the volumes must be obtained for each function performed and the intent of the process on the element (update, use and so on). The matrix is illustrated in Figure 2.

- **Gross analysis:** As the investigation of each information system is completed, the transaction matrix is turned over to the senior data base analyst. The transaction matrix is plotted for a logical view in order to accomplish all the functions.

- **Information model.** Upon completion of all transaction matrices for all information systems, the user, information systems personnel and the senior data base analyst team members work together to build the information model. All functions are discussed and all team members must sign off at completion of the information model (Figure 3).

- **Presentation to management.** The information model is now the site plan and can be explained in that manner to management. It is understood that the inventory management data within the merchandise model (Figure 3) must be the first information system developed.

The enterprise might have other priorities. Nevertheless, DP still has the understanding of which data must be loaded in order to create any of the information systems. Strategic planning cannot be done without consideration of the data architectural drawing (information model).

This map must be addressed every time an information system is constructed (see Figure 4).

- **Data definition.** The team continues to define the business descriptions and attributes associated with each element. This information is loaded to the data dictionary.

- **Physical data base.** Once the information model has been created, a physical data base is created and presented to the team. Various data base design tools could be considered for creating the physical data base. Once signed off, modeling begins using the transaction matrix volumes and a simulated accessing requirement based on the intent for each function.

The model is modified until the best performance can be obtained. The results, along with the physical data base, are again presented to the team by the senior data base analyst.

Information Systems Architecture

Once management has selected the information systems sequence for development, based on the information model (Figure 3), the "electrical and plumbing" construction can begin. This is the most critical step and the step most often bypassed.

The processes are examined according to how the document would flow from desk to desk in a manual setup. The information systems analyst must break down these processes. The senior data base analyst and the information systems group then examine each one for "selecting process key" and "ending process key"

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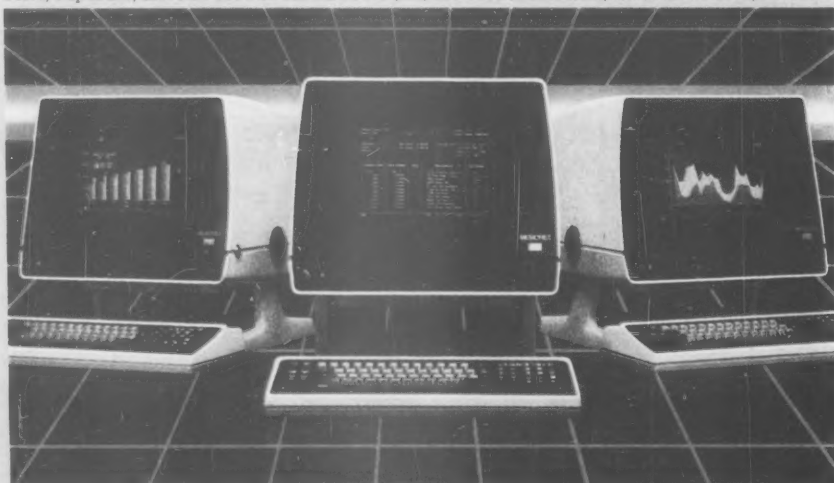
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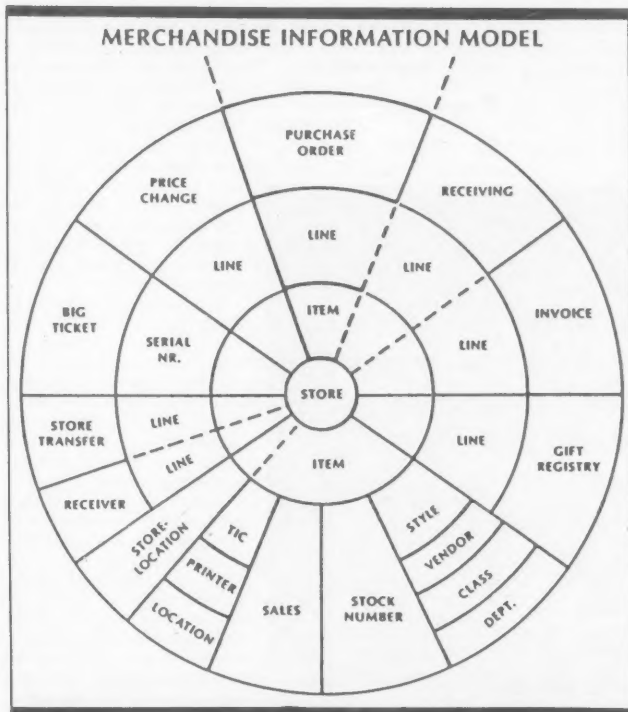


Figure 3

such as, in the case of a purchase order:

1. Initial entry (working).
2. Unapproved.
3. Approved — hold.
4. Approved — send.
5. Receive.

The processing key is established by process as a result of the functions to be performed. The idea is to break the integrated data base into small files for each process; however, the key information is also available for inquiry on a specific purchase order.

This approach allows for the small files that have been created in the past by giving access by process rather than reading a whole group of records or the entire data base. In addition, the systems analyst gets an idea of how to design the system, what an inquiry is, day-to-day functional processing, batch and so on. The processing key will be defined better in the detail analysis and continually updated over time.

The next step is to gain an understanding of how this system will function in on-line, distributed or batch mode. At a meeting of operations, technical support, data base and other personnel, the system concept is presented along with the modeling data.

All concerned must sign off on the system and make estimates for each job including lead times, human resources, equipment needs and so on. At the end of each process, the data dictionary is updated and another model is produced.

The configuration management

group must maintain the development plans, as they represent the organization's key to understanding when a given part of the integrated data base will be in production. They also are the group that coordinates all activities with the information systems group. In other manufactur-

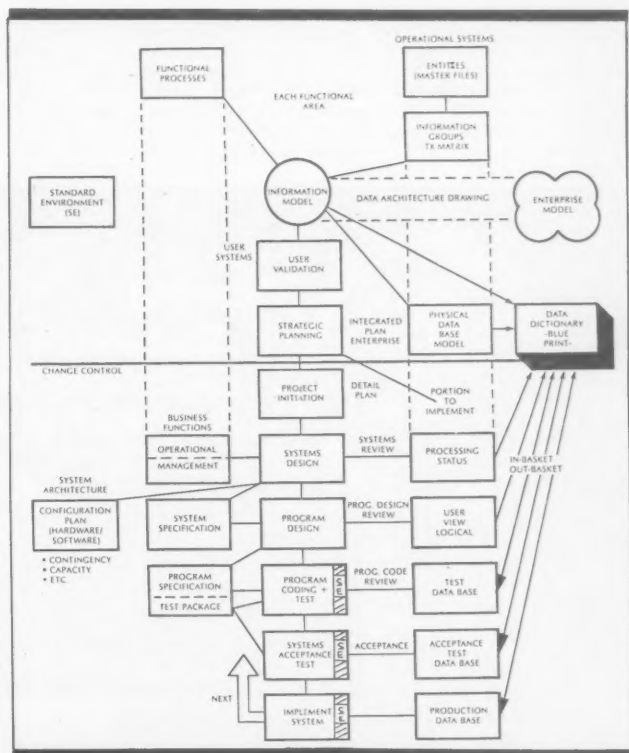


Figure 4

ing environments, they are considered production control.

Depending on the organization's size, several levels of the plan must be created after the system architecture is complete. The plan must in-

clude an overall plan at the enterprise level, data processing level and departmental level and, finally, a detail plan at the project level. If adequate time and care are taken at this stage, the entire development effort

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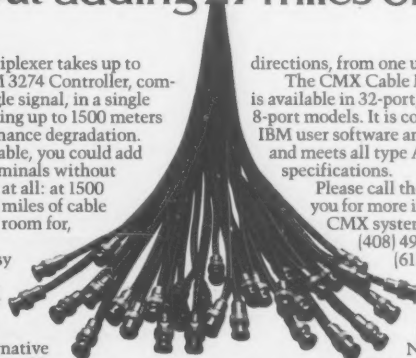
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IN DEPTH

will be more orderly.

Through frequent reports, management should be made aware of all activity. Possible problem areas must be highlighted so that the proper decisions can be made.

In the past, DP has created plans that say nothing more than "code, test, implement," with little understanding or support given to all organizational units that will feel the effects of information system development.

Project managers should be taught how to plan along with every other level of management. However, education is not the only approach. They need assistance

as well. No one should be afraid to seek help when constructing the system.

Data Management

Much has been said about data being a corporate re-

source. The statements are all true. However, data can never be used effectively unless the information system has been constructed to supply information as needed.

With the creation of the environmental management area, information systems are protected from changes in technology and data and, as a result, the application dollar investment of the enterprise is protected.

Configuration management has confined the data to integrated data bases for each functional area. The data has become understood and now independent from technology. The information models can be restructured using any DBMS or new technology enhancements. However, so far this approach has been theory, and no information system has been engineered.

Data management works directly with the information systems project teams. They develop, test and move into production the portion of the integrated data base being developed. Three areas are included in data management: data administration, data base administration and data base management.

Data administration. Data administration provides the blueprint to technology. This function provides an active quality assurance program that begins at the creation of the information model and extends through the day-to-day production of the information system.

The data administration group ensures that plug A will in fact fit plug B. Therefore, they have complete control over all names assigned to all components of the DP environment.

Their tool is the data dictionary, which maintains the data about data, information systems, network, computers, software and so on. Data administration is the enforcer of a strict change control procedure.

The data dictionary con-

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IN DEPTH

tains planning data as well as production data. All documentation is produced from the dictionary and it must produce all data base definitions, standard environment access ability, program source code and network and operations documentation.

Data base administration. Data base administration is the function that develops the integrated data base. Through a close relationship with information systems development, this group must work with data administration, which has complete control over data access and even the routines used within the information systems.

The data base administration group begins with the integrated data base created by configuration management and the data dictionary, which defines the details of the integrated data base. Information Systems begins with the systems architecture drawing and business requirements document. As a team, they begin the systems development life cycle steps under a strict change control procedure.

- **Detail systems planning.** All documentation produced to date is reviewed, including the draft of the project plan. A detail project plan is created and approved by management and forwarded to the planning support group (configuration management).

- **Detail systems design.** The systems analyst uses some method such as Hipo; however, top-down or bottom-up is not the issue. The data base analyst is involved at this point to ensure that data base accessing is used to the fullest and that the trade-offs are completely understood by the analyst.

Next, the analyst is provided with standard transaction codes (if batch), screens and so on, in order to ensure conformity to the standard environment.

Once the specifications are complete and the inputs and outputs defined, the DBA begins to create the logical data views for input to the data dictionary.

Next, test data bases are established with backup/recovery. As each program specification is completed, a program design review is conducted with the analyst, programmer and DBA.

After the design is approved by the team, the analyst begins to create the *test package*. This step must not be overlooked as the test package will live as long as the program. It is the standard of change, the component tester. The test package is loaded to the data dictionary.

The conversion and implementation plans are created and reviewed for sign-off by the team and program copy books or access data are given with each program.

- **Systems development.** The integrated data base update is provided within the test systems along with all entries supporting the integrity of the data base.

After the programmer codes his program, a code review takes place. If it is approved for test, access to the test data base is permitted by updating the standard environment. This step is important, as any bad program could shut down testing for all projects.

At the end of the unit test (program test), the test package is reviewed. This can be accomplished via a test version of the standard environment that prints out "before

and after" images. If approved, the program, test package, documentation and data base supporting routines are frozen within the data dictionary.

- **System test.** Once all unit testing is complete and the system is frozen, the systems test takes place. The test packages are run against the information system and the information system continually modified until the systems specification has been met.

- **Production reading review.** A complete review of the information system and integrated data base is made along with all documentation. Data base management is involved to approve the system for acceptance testing.

Data base management. Acceptance testing is carried out by generating all supporting programs, the integrated data base, documentation and test package out of the data dictionary into acceptance test library.

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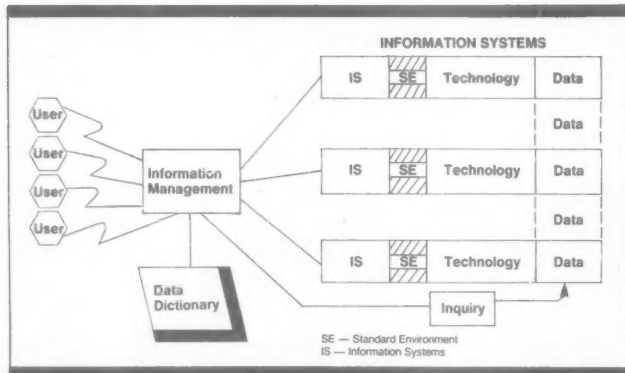


Figure 5

ies. The system is then tested with all other information systems in production. If any component fails, the system is returned to data base administration and information systems development personnel.

Once the acceptance test is complete, a production status review is conducted to ensure all support hardware and software are ready. Then the system is converted via the plans established earlier and all sys-

tems are generated from the dictionary into production.

Data base management monitors the production process and if problems arise and corrections are needed, an acceptance test using an updated (if necessary) test package is once again executed.

Information Management

Information management provides the user with a single contact

point for all questions regarding information systems, information access and problem resolution. Users do not really care if the problem is occurring with any component of DP; they just need solutions.

Information management, through the use of the data dictionary (blueprint), provides the user with information about information (see Figure 5). Information management consists of two functions in order to provide the user with a total information center concept:

Information control center. All requests or problems are given to Information Control. That group analyzes the request via the data dictionary and applies the proper solution.

Requests are analyzed to ensure the information is not already supplied. As a result, this group supplies information based on need to know.

If in fact the request is a complete information system, the request is forwarded to configuration management.

If the request is above and beyond the information system, then the necessary information access is supplied with the request and forwarded to the information center for support.

Information center. The information center provides the enterprise with answers about how to obtain information from data processing.

It provides tools beyond the day-to-day operational systems. Any tool given to the user must be understood and supported — be it an office system, minicomputer, on-line inquiry facility or batch facility. If the enterprise begins to feel that support is inadequate, then users will handle these matters in their own areas and DP will suffer as a result.

The information center concept must be used to provide support for new technology once it is approved by the environmental management group. Ultimately, this support will add valuable protection to the information systems investment of the enterprise.

About the Author

Terry G. Goodbody has more than 20 years' experience in data processing. As manager of information management for Carter Hawley Hale Stores, Inc. in Anaheim, Calif., he is responsible for data administration, data base administration and data base management in a centralized information systems support organization.

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SPECIAL REPORT

Applications Packages: Software in the Fast Lane



Edited by Paul Gillin and Lois Paul

February 28, 1983

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Can Be Intelligent, Profitable Decision

Application Software Use Comes Into Its Own

By Dave Litwick
And Joe De Martino

Special to CW†

Should your company consider packaged application software? In the 1960s the idea was viewed with suspicion. But a number of events over the past decade have made packaged application software an intelligent and profitable decision. Among the most important are:

- Increased machine power.
- The need for software flexibility.
- Changes in the programmer market.
- Development of better software tools.
- Growing sophistication of software houses.

The last decade has seen major improvements in the capacity of computers to handle complex software. Real storage is now normally measured in megabytes and the almost universal implementation of virtual memory has improved the situation even more. In addition, processor speeds have increased dramatically.

The surprise has been that the complexity of applications has increased even more. The more power we put into computers, the more we ask them to do. The result is the so-called "software bottleneck."

The response to the problem has been to develop software methodologies such as structured programming and to create a set of sophisticated tools such as data base management systems, report generators, query languages and application development systems. But the effect of these tools has been to increase the demand for complex applications.

As applications become more complex, it becomes increasingly necessary to keep them flexible. More complex applications reflect more detail and are therefore more subject

'More complex applications reflect more detail and are therefore more subject to changes that may occur in the business environment.'

to changes that may occur in the business environment. The software necessary to support them requires more lines of code and more complicated relationships. Therefore, it is harder to change once it is developed.

A combination of more complex applications and the wider use of data processing has also created a huge demand for programmers. To date, this demand has not been met and programmer salaries have increased rapidly.

There is a degree of risk when deciding whether to develop in-house or purchase outside. By some estimates, a material requirements planning (MRP) system can take over 50 man-years to develop and can cost \$2 million to \$5 million, far more than the most expensive package on the market. More importantly, in-house development efforts do not pay dividends for several years and sometimes not at all. The end product runs the risk of not meeting design specifications or being written to specifications that no longer exist.

Increased demand for applications

coupled with scarcity of trained personnel has led many organizations in the direction of packaged software. Applications developed in-house suffer from the understandable myopia of their own environment. But when a software house writes an application package, its view must be as broad as the entire marketplace.

Furthermore, the maintenance of a packaged application is the vendor's problem. Perhaps more than any other product, software suffers from personnel turnover. Successful software companies suffer less from this problem because better qualified people tend to migrate to them and stay put.

Before doing business with a soft-

'Most DP shops are not set up to develop and maintain quality manuals... this is part and parcel of a software developer's business.'

ware company, it is a good idea to check its staff situation. Does the company have the financial resources devoted to research and development to maintain a top-notch staff? What is its turnover rate? If possible, check the DP grapevine. Is a job at the vendor considered a "plum" in the market, hot enough to attract and keep the best engineers?

The proliferation of computers in the '60s and '70s led to an increase in the demands made on data processing departments for new and more sophisticated applications. During this period the software industry concentrated on providing tools to aid in the development of applica-

tions — tools such as data base management systems and teleprocessing monitors.

The integration of these tools with data dictionaries led to faster development of applications that were better documented and therefore easier to maintain. By basing system designs on integrated data base/data communications software, companies were able to develop systems that were, at least in part, independent of the data being used and therefore easier to modify and enhance. By acquiring tools such as user-friendly report writers and query languages, DP departments were able to give the end users direct access to data.

Vendors of system software are now beginning to offer application systems based upon the software tools they provide. These new application packages will be based upon state-of-the-art technology in system software and will therefore be more flexible and easier to implement and maintain in a wide variety of environments. Furthermore, they will be designed specifically to take full advantage of such facilities as data base management systems rather than just provide interfaces. This makes it extremely easy to tailor and integrate the packaged application with existing nonpackaged software.

When evaluating software packages, companies should look closely at the system software upon which the packages are based. Many application software vendors claim to have flexible systems because they are able to support many data base systems and file access methods.

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Raychem Corp. Technology Division's Rick Campbell and Joan Brick discuss data to be analyzed by the RS/1 research software.



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User-Friendly Software Fills Programmer Gap

MENLO PARK, Calif. — A company that lacked a staff of programmers but needed to computerize found that user-friendly software was not merely a nicety — it was a necessity.

Raychem Corp. is a manufacturer here of plastics and other materials for use in the aerospace, electronics, telecommunications, power distribution and process industries. According to Walter Johnson, computer services manager for research and development, "Raychem's strength is in applied research, in the company's ability to develop and capitalize on unique material properties."

In the Corporate Technology Division, researchers work on new technologies, which include products like heat-shrinkable plastics, heat-recoverable metals, fiber optics and high-temperature polymers.

In 1981, Johnson and Kevin McHugh, senior staff member in the R&D computer group, were doing intensive comparisons of computer hardware needed to help manage the mountains of data being collected in McHugh's electrical test projects. It was the accompanying application software that led them to their final choice.

"In our environment, we don't have programmers, so we needed

user-friendly software that the researchers could manage themselves," Johnson explained. "We were looking at Digital Equipment Corp.'s Dataview for data base management, Minitab Project's Minitab for statistics and a stand-alone plotting package for device-independent graphics. Then we found RS/1."

Raychem chose RS/1-The Research System, developed by Bolt Beranek & Newman Research Systems of Cambridge, Mass. Designed for research laboratories, the package provides data entry and retrieval, two-dimensional and three-dimensional graphics, statistics, curve fitting and modeling. It runs on DEC's VAX-11 and PDP-11 computers.

"It was the other three modes vs. RS/1, and RS/1 won out," Johnson said. "RS/1 has managed to accomplish what the other three together would have done."

In December 1981, Raychem's Corporate Technology Division bought a VAX-11/750 along with RS/1. In March, the group installed a VAX-11/780 and in August, another 11/750 at Raychem's research facility in Swindon, England. In December 1982, the company ordered two more RS/1 systems — for the VAX-11/780

(Continued on SR/8)

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Manufacturer Survives Package Conversion

SAUSALITO, Calif. — It was a potentially difficult conversion: from a homegrown, custom system to a full-function manufacturing package, from a mainframe to a minicomputer. There were setups at two locations and a customer who wanted to bring up a number of software modules at once and shut down the mainframe as quickly as possible.

It was risky too. Aggressive implementation would expose weaknesses in bad hardware or software, possibly resulting in hopeless snarls.

But there were no snarls. The E.D. Bullard Company here turned to Industry Data Services, an integrated systems vendor in nearby Santa Clara. In four months, 13 of the 20 modules in Madic, the manufacturing information system marketed by Industry Data Services, were implemented on a Prime Computer, Inc. 1450 interactive computer system.

Founded in 1898, Bullard is a traditional, mid-size manufacturer of industrial safety equipment. Although it is still headquartered in Sausalito, Bullard moved its molding, assembly and machine shop operations to Kentucky in the '70s.

Unlike most old-line companies, Bullard long ago embraced computers, but its 15-year-old mainframe system did not offer sufficient capabilities for the larger company. Despite having spent a large sum for hardware and software maintenance and salaries for nine programmers, operators and keypunchers, the company still lacked certain capabilities.

Bullard's data base was often stale. Computer-generated information was not sufficiently detailed to iso-

late problems, nor was the information integrated in a way that would aid in future planning decisions. Managers at the two locations lacked

agement Information Systems Director Russ Douglas, Bullard chose the Industry Data Services/Prime team.

Unlike many companies embark-

'The Bullard people knew what they wanted: a system that would support its manufacturing operations and provide financial control.'

simultaneous access to information. In the fall of 1981, Bullard accepted a change as inevitable.

After a 12-month concentrated effort by Vice-President of Manufacturing Ralph Gatto, Vice-President and Treasurer Jed Bullard and Man-

ing on such a search, the Bullard people knew what they wanted: a system that would support its manufacturing operations and provide financial control. The system had to be integrated and user-friendly to help cope with "people prob-

lems" associated with a switch from batch to interactive processing. And it had to be installed quickly.

Bullard put out a request for proposal to 13 hardware vendors, including Prime. Prime's San Francisco office then asked Industry Data Services, its Santa Clara dealer, to prepare a response. Industry Data Services bid for Madic.

Gatto, Bullard and Douglas spent four weeks evaluating and rating proposals, module by module. The final decision was between Industry Data Services/Prime and another well-known vendor.

(Continued on SR/6)

Packages See Greater Use

(Continued from SR/2)

What this in fact means is that the design of the application must be based upon the least sophisticated system software supported.

No matter how feature-laden a software package may be, it will not be an attractive or wise investment unless it is supported by a stable and reputable vendor. When bugs are detected, sophisticated support operations should be in place to make the necessary corrections within a reasonable amount of time.

The overall package, however, does not consist just of software, but also of documentation and education. With many in-house development efforts, these areas are considered incidental and are addressed only if time and other resources allow.

In summary, the case for packaged applications is formidable. As the demand for more complex applications grows, companies will find it increasingly difficult to develop timely and cost-effective systems in-house, and the trend toward packaged application software will continue.

Litwack is vice-president of product development and De Martino is manager of product management at Cullinet Software, Inc.

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At Machinery Firm's Sites Worldwide A/P Installation Warranted Careful Planning

WOODCLIFF, N.J. — Installation of a software package can be a massive task, as Ingersoll-Rand Co., an industrial machinery firm, learned during its project of installing an accounts payable system at over 30 division sites worldwide to standardize its accounting procedures.

The number of divisions in which McCormack & Dodge Corp.'s AP Plus system is going on-line could continue to increase, since the system will be made available to all company locations, according to Ingersoll-Rand's Richard Bradley, fi-

nanacial systems project leader.

The installations have required extensive planning by Ingersoll-Rand, which has 100 plants in 17 countries around the globe and had net sales of \$3.4 billion in 1981.

Bradley and Clifford Hay, financial systems program manager, recently explained their comprehensive installation procedures step by step.

"It's necessary to understand how we in the financial systems department function," Hay said. "We have no direct authority, but function as a

consulting department for our field sites." The department also serves as an educational base for the AP Plus program, since it has prepared six courses about the accounts payable software.

Management Overview Course

Initially, one of these courses, a six-hour management overview, is given to the plant managers who use the firm's IBM System/34, /38 or 370/4300 hardware and who are interested in installing AP Plus.

Then, Hay and Bradley conduct an

intensive, one-week training program at the division for the site project leaders. This course, based on the one-week curriculum developed by the Financial Systems Department, uses a manual about 800 to 900 pages long and includes "everything from soup to nuts," Hay noted.

During the next stage, the project leaders develop a conceptual plan detailing how they will use AP Plus. "We ask for all the details that they can provide up front so they don't walk themselves into a corner when they start installing," Hay explained.

The plan is sent to the Financial Systems Department for Hay and Bradley's review. Hay or Bradley then returns to the division to make recommendations based upon their review of the plan.

"Then we provide the software," Bradley said. This step initiates program installation, testing and data load.

During this phase, Hay and Bradley help the site managers in three ways. "First, we maintain a fairly high level of telephone contact, so that we're pretty much abreast of their progress," Bradley noted.

Secondly, the two financial systems leaders also learn about the implementation progress and any problems by reviewing monthly reports that the site project leaders complete and return.

Finally, Hay and Bradley also visit the site as necessary. Hay pointed out that a simple installation may not require a visit, but a complicated installation may require up to four visits. Usually, one of the two returns to the site once or twice for interim reviews.

The next stage, running AP Plus in parallel with the old accounts payable system, may also include a visit from Hay or Bradley. At this time they ensure that both systems are running accurately, Bradley said.

Once AP Plus goes live, Hay and Bradley begin an "extensive on-site, post-implementation review," Hay noted. The site is scrutinized to make sure that employees operating the software are cross-trained, that all records are retained and that internal controls are orderly. "Those are the areas that may be remiss," Hay pointed out.

Planning for a thorough implementation like this requires time, according to Hay. He said that site managers are contacted about one year in advance of AP Plus implementation in order to canvas interest and set site priorities. The installation requires four weeks for a division with a small computer to about six months for a site that has 10 divisions sharing a data base, according to Hay.

Hay and Bradley also continue their intervention with AP Plus sites by offering the four other courses developed by the financial systems department and by sending a quarterly newsletter, eight to 12 pages long, which focuses on ideas drawn from other sites that have explored

(Continued on SR/6)

PAYROLL/PERSONNEL SYSTEMS, THE DIFFERENCE

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Old-Line Firm Survives Risky Conversion

(Continued from SR/4)

Gatto cited the strength of the Madic manufacturing package as a key factor in its selection.

But Gatto and his group also looked closely at what wasn't available. "If they didn't have what we wanted, we needed to know that we could get it. Support was vital to us," Gatto added.

"We didn't expect it to be perfect," Gatto said, "but we knew we could find ways to make a good system work. Madic's structure was well thought out. It really fit together."

Bullard's strategy was to implement everything — or at least the business func-

tions — at one time. Industry Data Services first set Bullard up on its time-sharing service. Next Prime installed its I450 minicomputer with CRT terminals in Sausalito and Kentucky.

Industry Data Services spent a total of 20 days over the next four months setting up and implementing the

software system.

Implementation was on deadline. Even Gatto was unprepared for such a smooth transition. "Next time we would not go parallel for two months," he said. "It's nerve-racking with so many modules. One month would really be enough."

Immediate cost savings

justified the new system and the potentially risky decision in bringing it up so quickly, Gatto said. The data processing staff was reduced from nine to one. The monthly software/hardware lease and maintenance costs of more than \$10,000 were also cut. The intangibles — speed, detail, overview, flexibility,

vastly improved communications and improved business practices — were as significant as the reduced costs, he said.

Most important, Bullard insists, they have put terminals out in the plant. Everyone has access. Everyone has input. "That's where the revolution is," he said.

Firm Installs A/P System

(Continued from SR/5)

unique capabilities of AP Plus and addresses sound implementation techniques. The newsletter is currently sent to 450 Ingersoll-Rand employees, Hay said.

Bradley and Hay are also prepared to help site leaders as the sites upgrade to new hardware, as new employees need training and as new divisions or acquisitions decide to install AP Plus. The Financial Systems Department is also responsible for on-going maintenance and installation of enhancements at divisions having already installed the package. According to Hay, the process never really ends.

A major corporation like Ingersoll-Rand chooses the software for its extensive operations carefully, and Bradley and Hay described how they chose the McCormack & Dodge accounts payable system.

The software firm beat its competition by fulfilling more specifications sought by Ingersoll-Rand, Hay said. The Ingersoll-Rand Financial Systems Department came up with 45 specification requirements in May 1981. Of these, almost every "must-have" spec was met by AP Plus, and about half of the "nice-to-have" specs were provided, Bradley noted.

Most importantly, the AP Plus software offered financial systems standardization, state-of-the-art sophistication and McCormack & Dodge support, according to Bradley and Hay.

"Thanks to these elements, I think that there's a dollar savings in terms of additional control that the system will provide," Bradley said.



Say Goodbye to Computer Under-Use!

With Planning and Communication

Installing Applications Package Can Be Painless

By Bob Bray
Special to CW

With adequate planning, communication and effort by both parties, installation of an application package can be practically painless. Using the guidelines below, correct preparation and realistic ex-

pectations will pay off in savings of time, money and headaches.

Investigation. Investigate the vendor and the specific applications to be purchased. Know what is needed by the end user before contacting vendors. After contacting the

vendor and receiving information on available packages, give the materials to users for review before scheduling a demonstration. The users will then be able to ask more informed questions.

Check each vendor by

calling current customers or visiting installations where the software is being used. Talk to the DP department and users. Find out if the package operates as represented. View the documentation and ask for comments from customers. If you re-

ceive negative comments from a particular customer, discuss it with the vendor.

There are possibly two sides to the story. If you hear totally negative comments from all the customers, do not buy the package, but let the vendor know why you decided against buying. Do not shy away from a package only because there are no other users of that particular package. If other packages offered by the vendor are highly recommended, the new application will probably be written with the same standards.

Also, discuss with current customers the capabilities and professionalism of the vendor's staff. A high turnover rate could indicate serious management problems. Are customer support representatives easily accessible? Are questions answered in a timely manner? The individuals involved can be the critical element in success or failure of any installation.

Negotiate. Beware of any package or service acquired cheaply. The product most likely warrants the price. Any deduction from list price may be compensated for in another area. Remember — if the vendor does not show a profit, he will possibly not be around when you need support.

Compare prices on various packages with the functions available. Develop a scale to assign points to all aspects of the packages. Use this scale to evaluate prices. If the desired package is overpriced, explain your determining criteria to the vendor. Usually, an accommodation can be reached.

Modifications. Anytime modifications are to be made to an existing application, or a new application is to be written, all specifications should be submitted in writing. Any vendor with experience will allow minor changes after the contract, but cannot afford to give the customer a blank check for further modifications. Users should review and sign the specification before a final bid is made.

Once the contract is set, stick to it unless a major design flaw is discovered. Do not expect the software vendor to be able to hit a moving target. Set reasonable delivery dates allowing for possible problems. Be careful when telling management the system will be ready on a specified date. Allow plenty of time for in-house quality

(Continued on SR/8)

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Planning Key to Painless Package Installation

(Continued from SR/7)

assurance before beginning parallels. Always run parallels. Document any problem completely before calling the vendor.

Installation. One of the most frequent problems during installation is lack of preparation by the user. Each person to be involved in the installation should read all available documentation before the installation team arrives. You should also make arrangements to free those who need to be trained on the applications.

Be aware that the normal work flow will be interrupted during the installation period. Plan ahead for

work that must be accomplished and inform the vendor of the schedule beforehand. Set up an area for the training personnel which includes access to terminals and telephones. Expect long hours during the installation; the vendor does.

Post-Installation Support. Read

the documentation. If it does not explain the answer sufficiently, let the vendor know. It will improve his product and reduce his nonbillable time. If problems occur, provide the vendor with as much information as possible. Send any comments, complaints or suggestions to the vendor

in writing. If the action taken is not satisfactory, notify top management of the organization in writing.

Three cases help illustrate mistakes to avoid in buying and installing an application. We sold a package to a firm that investigated us

(Continued on SR/10)

User-Friendly Tools Fill Programmer Gap

(Continued from SR/3)

and the UK VAX-11/750. "We are making RS/1 our corporate standard," Johnson explained.

McHugh said he has used the data

management, statistics and graphics capabilities of RS/1 for an electrical test project. "With 50 to 60 researchers in the project, I wanted the users to manipulate their own data instead

of depending on me to write programs for them," he said.

Data is collected on a network of PDP-11/23s and copied onto the VAX-11/750 for use with RS/1. McHugh set up a simple mechanism for users to move their VAX/VMS files into RS/1. "It takes only two minutes to copy a 200-block file, so our users routinely move their data," he explained.

To effect the transfer of data, McHugh used RPL, the research programming language available through RS/1. RPL enables users to extend and tailor system capabilities, construct new analysis procedures and access other programs, resources and data files, McHugh said.

In the electrical test project, researchers measure polymers for such responses as resistance vs. temperature, resistance vs. time, resistance vs. temperature and time and voltage vs. time. "Before RS/1, we could test only resistance vs. time and temperature. We can do more work now than we could before," McHugh said.

Moreover, each user can manipulate data through RS/1 without a programmer's intervention. "Each user wants to do something different with his data," McHugh said. "They can create a simple graph from their data and can massage it with curve fitting and fancy mathematics. If they want to do any massaging, let RS/1 do it. RS/1 freed me to do acquisition of data, which is more difficult and satisfies the greatest number of users."

Johnson reported that RS/1 is strong in three areas. First, researchers can easily display and graphically manipulate their data, he said.

Second, users can pull data from their files and use it in an almost infinite variety of plots — without the need for programmers to develop the plotting routines.

The third strength of RS/1, according to Johnson, is its impact on Raychem's research community. "We see a significant increase in the number of people who are turning to the computer in order to perform their work," he said. "In the past, their data has often gone unanalyzed because of the difficulty of displaying it. With RS/1, once we got people trained, the number of users increased; they helped themselves to get through the basic operations and they helped other users."

Applications of the software have gone beyond traditional research, Johnson noted. It is being used in data management, in functions such as disk utilization and budgeting and as a general plotting package to plan space allocation in Raychem's new building.

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Full-Scale Inventory Aid Needed

Hospital Performs Major Software Transplant

TAMPA, Fla. — As part of an expansion program targeted toward meeting growing community needs and responding to changes in medical technology, St. Joseph's Hospital here saw the need to replace its existing software with more flexible packages.

"Our in-house system just couldn't keep up," explained Jerry Cox, director of systems and programming. "Our primary interest was to find a single vendor who could satisfy our reporting and data collection requirements. Once we found the software that met our needs, we were even willing to replace our hardware, if that were necessary," he continued.

Assistant Administrator Leo Murphy explained that after an evaluation period, a committee at St. Joseph's selected products from Management Science America, Inc. (MSA). In July 1978, St. Joseph's purchased six packages from MSA, including its Inventory and Purchasing System (IPS). The committee selected an IBM 370/148 to replace the existing hardware.

During the evaluation, the committee recognized the need for a full-scale inventory system. "At that time," according to director of pharmacy Don Carlton, "our system was an in-house manual stock card system that didn't keep a perpetual inventory."

Inaccurate Inventory

Joan Chambers, director of Central Supply, explained that "Central Supply is located all over the hospital, and it maintains all the supplies needed to keep a hospital going. But because the area is so spread out, the physical inventory count was never completely accurate. We were unable to prove there was an excessive amount of inventory or to track it."

"The pharmacy had been the only department that kept information on a computer," Carlton said. "But all we had then was an in-house system that produced a printout listing a three-month usage level of pharmacy items. We took this information, manually counted against it to determine how many items we needed to order and issued a purchase order."

"There was an inventory of \$315,000 in the pharmacy alone, which I thought was excessive. But our lack of control was so great that we didn't know how often an item was being used or the true cost of that item at any point in time. I also thought 5,000 items was an excessive number to maintain in the pharmacy — but, again, we had no way to prove that."

Implementation of the IPS began in February 1979; the system was scheduled to go live by Aug. 1. St. Joseph's remained committed to this schedule and dedicated the necessary personnel to ensure its completion.

The hospital paralleled IPS with its existing card inventory system for one month. Then it took a second inventory at the end of July. On Aug. 1,

IPS went live in the Purchasing Department, and the card system was discontinued — right on schedule. Pharmacy and Central Supply went live in the next few months.

St. Joseph's now orders its pharmacy and central supply items through the use of the economic order quantity, reorder point and safety stock features available in IPS.

"In the pharmacy, IPS automatically calculates the usage of our top 100 items," Carlton said. "When a particular item reaches a predefined reorder point, it automatically pro-

"Our primary interest was to find a single vendor who could satisfy our reporting and data collection requirements."

duces a purchase order. On the rest of the items in inventory, the system generates a report when the reorder point or safety stock quantity point has been reached for each item. When enough items are needed from a particular vendor, it completes a

purchase order listing item number and quantity. Purchase orders aren't automatically produced for low-usage items, however. The system enables St. Joseph's to order from a specific vendor all at once instead of making several small orders.

"The pharmacy has decreased its inventory from \$315,000 to \$210,000 using the system's optimization feature — a very drastic reduction," Carlton said. "We've also reduced the number of items in stock from 5,000 to 2,600, practically cutting our

(Continued on SR/10)

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Hospital Software Undergoes Major Transplant

(Continued from SR/9)
physical volume in half. This saves time, money and shelf space."

Another major benefit of IPS, according to Carlton, is its special reporting capabilities. This includes a daily Stock Status Report and a Demand History Report. The Pharmacy Department can now classify the pharmacy stock and get a separate printout that shows one drug has gone up and another has gone down.

"By collecting information on the number of units and the dollar amount of specific drugs prescribed by physicians, we've been able to show and educate the physicians on

the differences in the cost of generic drugs vs. name-brand drugs. This has resulted in a tremendous reduction in the amount of dollar volume of in-

'The pharmacy has decreased its inventory from \$315,000 to \$210,000 using the system's optimization feature.'

ventory we maintain. In turn, it's reduced the cost of health care to the patients," Carlton continued.

"IPS has helped a great deal in the control of inventory pricing," Chambers said.

"In a typical week, we usually

have 75 price changes out of a total of 2,600 items. When there are changes, the report highlights any price change that is 15% above or below

the previous price shown on the system," she said.

Patti Walker, manager of general accounting, agreed. "I definitely think one of the benefits of IPS is control. We can now match the revenues and expenses related to Phar-

macy and Central Supply. For example, if a department orders an item from Central Supply, the system automatically records the order and posts the charge to the MSA General Ledger System. And it does this for 100 departments."

The hospital can now maintain up-to-date prices with the IPS interface to its patient billing system.

According to Walker, "IPS maintains the average unit cost for all items in the inventory. We read our inventory file to find an item's average cost. Then we go through a mark-up process, compute a new patient price and compare it to the current patient price. If the prices are different, we update our price file in our patient billing system. We are able to reprice our inventory on a weekly basis with IPS."

"So we're always within a week of having retail prices, and we can charge our patients accordingly," she said.

Planning Makes Installation Easy

(Continued from SR/8)

thoroughly and negotiated a good deal, but failed to communicate properly with the proposed users. During the installation period, the users found several areas needing extensive modification.

An estimate of the man-hours and cost of proposed modifications was delivered to the director of DP who found himself in an untenable position. Management had been informed of the total price of the package and had been given a definite date for beginning live processing. Neither the price nor the date was realistic.

We resolved the situation by making the modifications without charge only because we were replacing a competitor's package that had proven unsatisfactory. Proper coordination with potential users would have prevented the situation from occurring.

In another instance, a contract was negotiated requiring extensive modifications to existing applications. Problems were discovered in several of the programs which could have been avoided with a more appropriate delivery schedule.

A financial application was installed at another customer site, but the installation team found the users too busy with current work to spend much time with the trainers. One month later, the customer was retrained at additional cost. Improper coordination by management when scheduling the installation led to the extra charges.

With active participation of all facets of the company through the entire process, many potential problems can be avoided. Heed the advice of the vendor. His experience is an asset. It is critical to both parties that installation be successful. Satisfied customers ensure future success.

Bray is president of ICS, a Phoenix-based software company.

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Church Firm Cuts Backlog With System

APPLETON, Wis. — Aid Association for Lutherans (AAL) faced a backlog of programming changes and updates when it attempted to make the information available on its various personnel and payroll systems consistently uniform.

In addition, the firm faced prolonged delays in retrieving information and obtaining personnel administration reports.

"With the conversion to a single system, payroll and personnel information is now consistent and reports are available, in some cases, in hours," Gordon Lundquist, manager of business information systems for AAL said.

Capture of data was inconsistent among the three different employee groups, he explained. Employee hire dates, for example, were included on the separate payroll and personnel systems used for the 1,500 district representatives selling insurance in all 50 states, as well as on the integrated personnel-payroll system used for our corporate staff of 1,200 persons. In contrast, the payroll system for the field clerical staff at 80 nationwide general agency offices did not include the employee hire-date information.

"As a result, comparing and compiling data for such items as Equal Employment Opportunity (EEO) reports was, at best, difficult," he said.

Saving Time, Money

"To write, test and implement the required changes would have taken years, a costly investment in software development and the time, resources and salaries of the data processing and programming staff," Lundquist recalled. Instead, AAL purchased a single, integrated payroll-personnel system that unified personnel and payroll record keeping, reporting and management for all of the separate employee groups.

The corporate staff, whether hourly or salaried, is now paid every other week rather than twice a month, Lundquist noted. Vacation time and benefits are now tracked by hours rather than by days. Salary administration for both exempt and nonexempt personnel was recently changed to the method of job evaluation developed by Hay Associates. Information required for

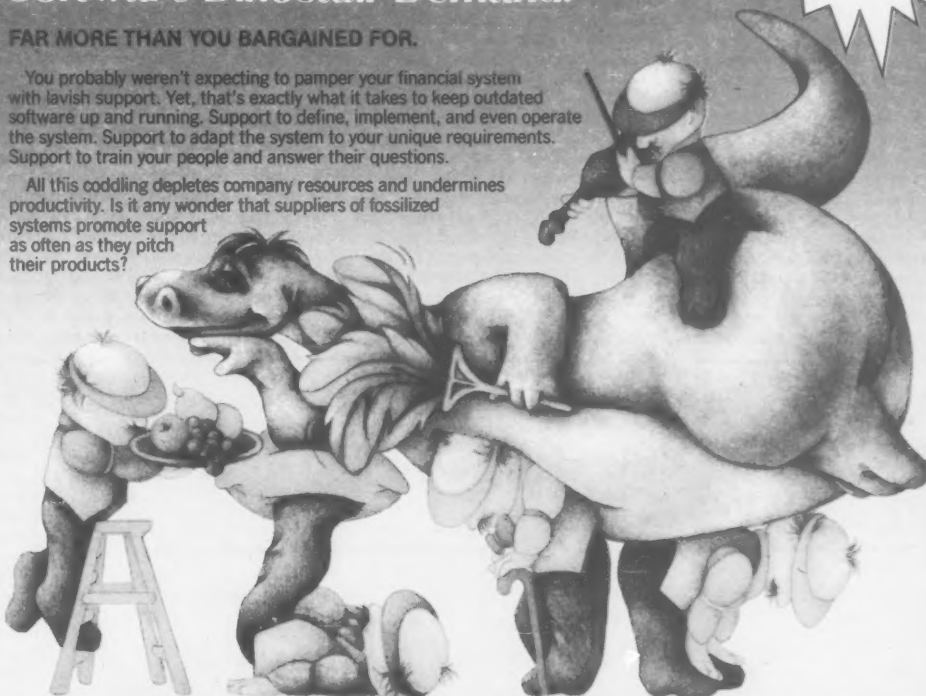
(Continued on SR12)

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Benefits Firm Ensures Uniformity With System

(Continued from SR/11)

EEO and Affirmative Action reporting will eventually be consistent for the association's entire employee population.

"More importantly, the system employs an information retrieval and reporting design that enables the association's user staff to enter, edit, validate, update and compile data using 'noncomputerese' commands," he said. "This enables our users, employees, salary administration, payroll and other executives, for example, to retrieve information and design their own reports profiling our employee population, struc-

turing organizational charts, developing salary grids, checking budgets and monitoring increases in staff."

Finished edited reports are usually processed overnight, others in hours, providing executives with efficient, effective tools for managing human resources, he added.

"In contrast, our previous systems required executives to request a report from our payroll or personnel staffs, which then explained what information was needed to our DP department. The DP staff then converted the request into computer languages, tested the programming and, after corrections, ran the reports

— a process that could require weeks," Lundquist said.

"Using retrieval as a management tool, we reevaluated our tax reporting procedures, for instance, and found we were reporting some data not legally required by some states and the federal government, which was, as well, costly to provide," he explained. The time required to edit reports and program system enhancements were cut by half because terminal users were able to access the data base directly, cutting the 3,000 to 4,000 hours required annually of the DP department for maintenance of the different personnel and pay-

roll systems, Lundquist said.

Aid Association for Lutherans is the nation's largest fraternal benefit society, with more than \$15 billion of life insurance in force. The association provides financial assistance to Lutheran and other nonprofit institutions. In addition, AAL's 1.3 million members are provided with the organizational and financial resources to perform charitable, educational and other benevolent projects in their local communities.

Eliminating Repetition

The firm employs a Human Resource System (HRS) acquired from Information Science, Inc. (Insci) of Montvale, N.J. HRS automates the processing and record keeping of payroll and personnel information, including job, wage and education histories, benefits, work locations and transfers, performance appraisals and salary reviews. This integration enables AAL to update an employee's payroll and personnel records from a single entry — for example, a salary change — and eliminate repetitive, time- and labor-intensive tasks.

The system was installed on AAL's IBM 370/158 and IBM 3033U mainframes in May 1981. It operates on both a batch and on-line basis and interfaces with general ledger and benefit plan systems.

Computer terminals with direct access to the system are located in the payroll department, as well as in the salary administration, employee relations, benefit plans and marketing departments. Moreover, the association possesses hundreds of other terminals located throughout their offices that may access the system.

To prevent unauthorized disclosure of sensitive information, access is controlled by terminal, individual user and passwords. Also, levels of access further restrict the distribution of information.

There has been no increase in the staffs of the personnel and payroll departments due to the HRS system, according to Lundquist. However, both departments are using the system to compile more information, develop more reports and provide more services, including more complete earnings and deductions statements, direct depositing of checks and building the Hay evaluation tables, as well as distribution of annual benefits statements.

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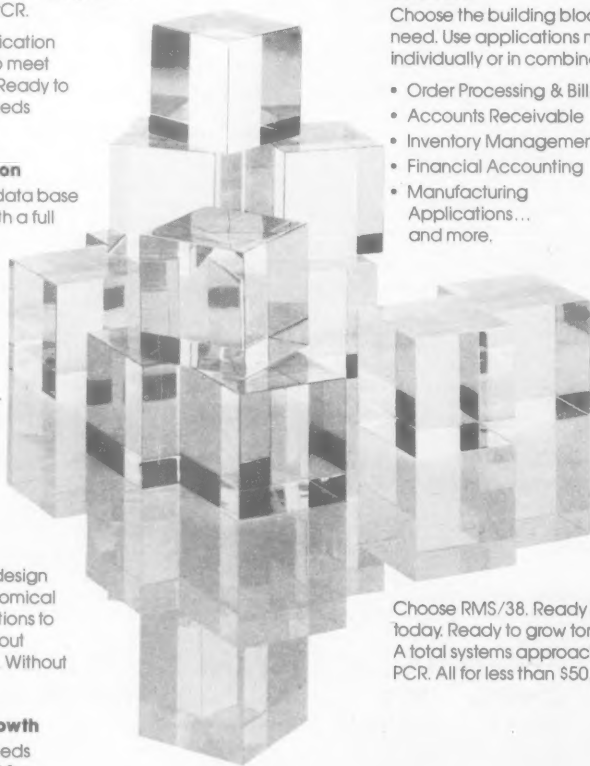
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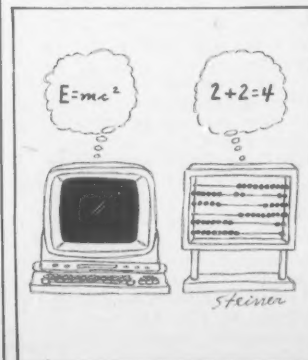


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Efficient Procedures, Standards Needed Software Documentation a Major Problem

By Frank Clark
Special to CW

On a recent visit to a software company to discuss a new software package, the first question I asked was: What type of manuals or other documentation exist for this package? The manager told me that he had nothing at the time but was "working on it."

Though not a typical situation at present, it demonstrates that the problems of software documentation are getting worse, not better. Two of the most persistent problems are poor writing style and inefficient manual development.

The writing style varies from the dense and cluttered style of the early accounting manuals to the "wow, gee-whiz" style of recent applications and systems manuals.

In explaining DP terms, some writing is so brief that it reads like a glossary. Some manuals are so full of coding and flowcharts that businessmen cannot get through them without professional help.

The Other Extreme

Some software houses go to the other extreme. They want to sell their software to everyone, so they set the reading level at about the sixth grade and use the writing style of a comic book.

Inefficient procedures present more serious problems for manual development. The documentation specialist is often the last person to learn about new applications software. He is at the end of the production line — just before the loading dock — and is expected to do his job as quickly as the packaging is done in the warehouse.

Procedures for documentation development must be more efficient. Once management approves of a new software proposal, the documentation specialist should work up-front with the project manager or lead programmer to aid in planning documentation development. This should include interviewing the marketing and technical staff to gather all pertinent information on the subject matter of the manual and asking such questions as: Why use this manual? How will the manual be used?

Then the audience level of the manual must be identified. For example, if the user is a technical professional the manual can easily be organized as a reference type of document. If the user is not a technical person, the writing should be tutorial in style.

The subject matter should then be organized into a table of contents. The next step is to get management approval for the table of contents, thereby establishing accountability for any subsequent changes to the documentation.

With the recent structured programming techniques, standards can be set for most applications programs. A major objective of structured programming is to break down large programming problems into

manageable segments. This should also lead to a modular and cost-effective approach to the documentation.

The actual writing should be a series of well-defined segments or modules of information, which are

specified in the table of contents. In this manner, documentation can begin when individual program segments are being coded and tested rather than when a completed program arrives several months later. In other words, programming and documentation should be done in parallel. This procedure puts the documentation specialist in the mainstream of software development — not at the tail end of an impatient system.

Structured documentation stands
(Continued on SR/14)

To Write or Not to Write

Who should not write documentation about applications software?

Programmers and engineers are not known for their writing skills and seldom assume fallibility on the part of the reader.

Nontechnical writers either shy away from the details of such things as syntax blocks, condition codes and shifting bits in registers, or else they need to spend a lot of company time learning the basics of computer systems.

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Common Misconceptions About MRP Dispelled

By Eric Lange
Special to CW†

The day of the individual running a complex manufacturing business by himself will soon be gone. Business is becoming too complex and is changing so quickly that materials requirements planning (MRP) systems are the only answer to help plants

keep ahead of their competition.

However, many companies are finding that misunderstandings about MRP exist within organizations. This is not surprising. After all, MRP is still a relatively new area.

The following are four common misconceptions

about MRP:

• *MRP is all right in theory, but won't work in practice.*

If you are planning to implement MRP, this attitude is almost certain to guarantee failure.

MRP does not work by itself; it has to be made to work. Making it work requires both the understand-

ing and commitment of your company. Positive attitudes, coupled with the right tools, bring positive results.

• *MRP is in our plans, but first we must implement reorder point (ROP).*

MRP and ROP are mutually exclusive. In fact, if your company "makes-to-stock" for finished goods and has

few, if any, manufacturing systems, then there is a danger of misconception.

Years ago, many companies introduced computerized finished goods ROP systems as the first step into the uncharted waters of manufacturing systems. It was quickly found that ROP often introduced more problems than it solved.

Some companies, under a manual system, use ROP not just for finished goods, but for all levels of assembly and purchased items. The assumption here is that you will not want to put such a system on the computer.

ROP systems react when a certain level of stock is reached. The due date of the order is almost never changed, though orders do become late. No attention can be given during the lead time of that order to deter-

(Continued on SR/16)

Here's Why Precision Visuals Is Now The Leader In Graphics Software Tools!

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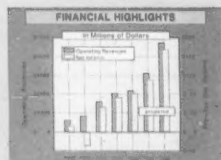
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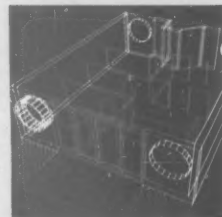
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Aid Manuals Deficient

(Continued from SR/13)

dardizes writing much like structured programming standardizes program code. Many users refer to manuals several times a day. These users should always be able to find information in the same format without wasting a great deal of time searching for it.

In addition, software changes or updates can be made in a limited segment of a manual without the need to reprint an entire publication.

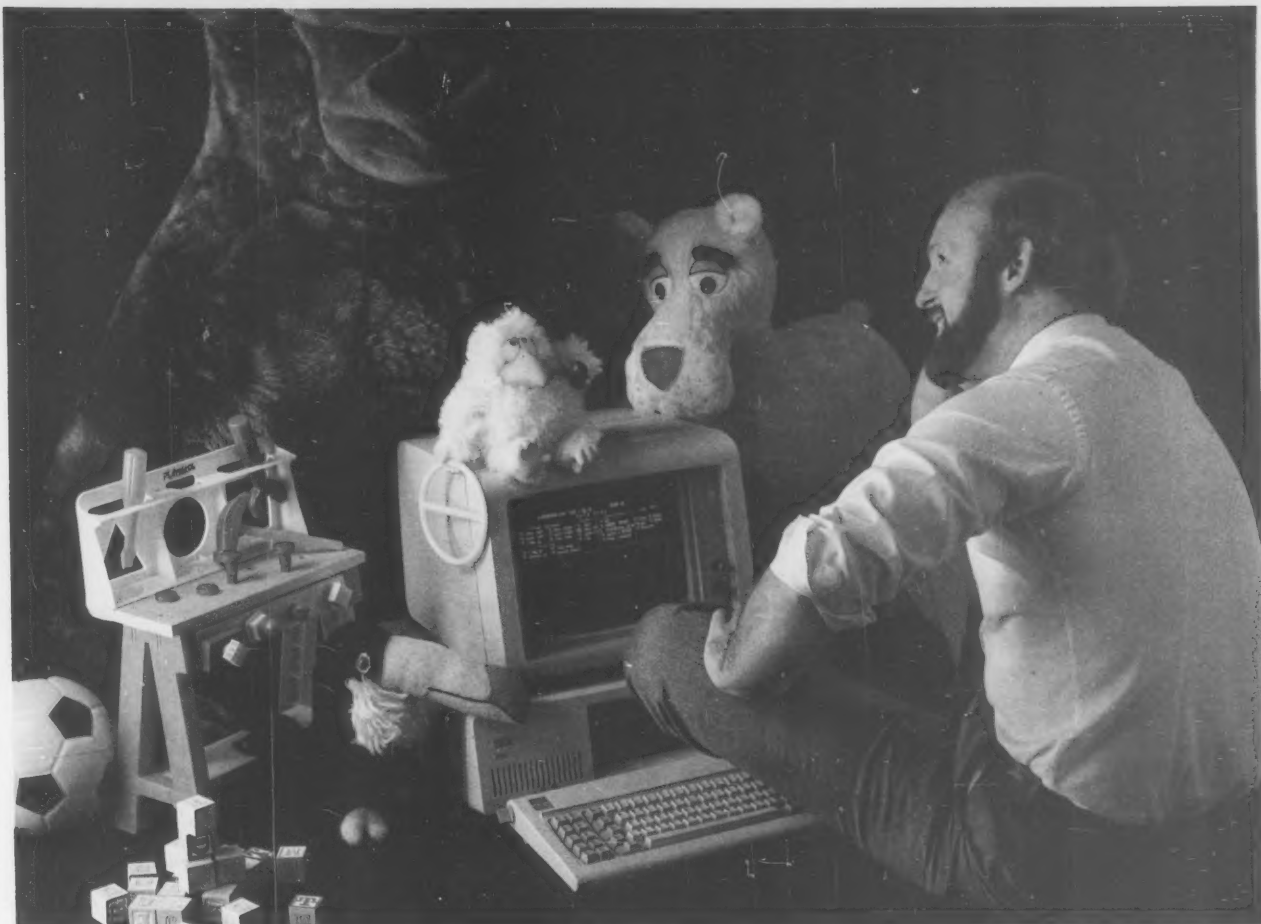
Most companies want their documentation specialists to spend as much time as possible on their word processors. They should only need to assign a liaison person to provide the necessary technical information required to document a new software product.

In small companies, the documentation specialist must often be his own editor, technical illustrator and production manager, responsible for formatting pages and selecting type styles.

Even larger corporations become overloaded at times when several new products are released at the same time. These are compelling reasons for a company to go outside for help.

As computers become more of a universal utility, documentation of applications software will have to be written as professionally as the programs it is describing.

Clark is a senior documentation specialist at Documentation Development, Inc. in New York.



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Four Misconceptions About MRP Dispelled

(Continued from SR/14)

mine if, because of slackened demand, the order could be delayed. Orders are given an urgent status if the item goes into safety stock — even when there is nothing wrong with using safety stock.

It is not always appreciated that MRP itself can integrally control the release of finished goods orders. Thus, items that may have been considered previously as ROP candidates can be controlled in a time-phased way. Orders can also be pulled forward or pushed back according to sales demand. Safety stock can be accounted for sensibly, and

urgent action is required only when the plan detects safety stock will run out in the future.

Within a "closed-loop" manufacturing system, the finished goods materials plan is introduced through the concept of a master schedule.

The starting point of MRP can be the control of finished goods on this time-phased basis. Be aware that the implementation of MRP makes ROP redundant. Therefore, it is unrealistic to build an ROP system when MRP is planned.

• Some people might need MRP, but our problem is capacity planning.

In nearly all industries, you must

tackle materials control before you can deal with detail capacity planning. The exception is if your prod-

'We have seen companies that have implemented capacity planning as a first step into MRP. The result is only a small increase in efficiency because the real problems were left unresolved.'

uct is virtually a "one-level" bill; the components are a limited number of plentiful and cheap raw materials

and you make to order. In this case, tackle detail capacity planning first.

In almost all other situations, there are capacity problems because of a lack of control before work hits the shop floor. You must look for reasons that are causing problems.

We have seen companies that have implemented capacity planning as a first step into MRP. The result is only a small increase in efficiency because the real problems were left unresolved.

The real problems are often caused by material shortages — not enough information about future work when planning that urgent customer order, "rush" orders unnecessarily rushed and work that could be delayed to allow completion of more critical work. This results in a limited ability to respond to priority needs on the shop floor.

By introducing an effective MRP, your capacity can be improved dramatically.

Increasing control over MRP will automatically create priority planning for production, facilitating a shop floor schedule. Only required work will be released to the shop floor. Rush jobs will be minimized and the availability of components will improve, thus preventing panic situations and improving capacity.

A good materials plan backed by a sensible "rough cut" or high-level capacity plan will make for greater efficiency than will capacity planning by itself. Capacity planning is the icing on the cake once you have implemented MRP.

If your problem is capacity, look hard at the real reasons before embarking on an expensive computer project that might only produce disillusionment and disappointment.

• MRP functional capability is important, not how MRP works on the computer.

When examining the alternatives in MRP, there are two decision levels: functional capability and DP complexity. It is not realistic to divorce one from the other.

Generally, the functional capabilities of most net change systems are similar. Other factors governing your decision are the strength of your supplier, technical quality of the software, availability of support, end-user education and DP implementation.

The system must also be integrated with other DP systems and thus must be modifiable by DP personnel. It must be adaptable to your special needs and to future changes as the system develops.

Buying a package reduces the time, risk and money involved in bringing a manufacturing system "on-stream." A major time-cost component is people, often those you do not have.

When examining alternatives, draw up a checklist of general functional and DP requirements. Make sure the candidates match both areas before proceeding to detailed research.

Lange is product manager, manufacturing, for Cincom Systems, Inc. in Cincinnati.

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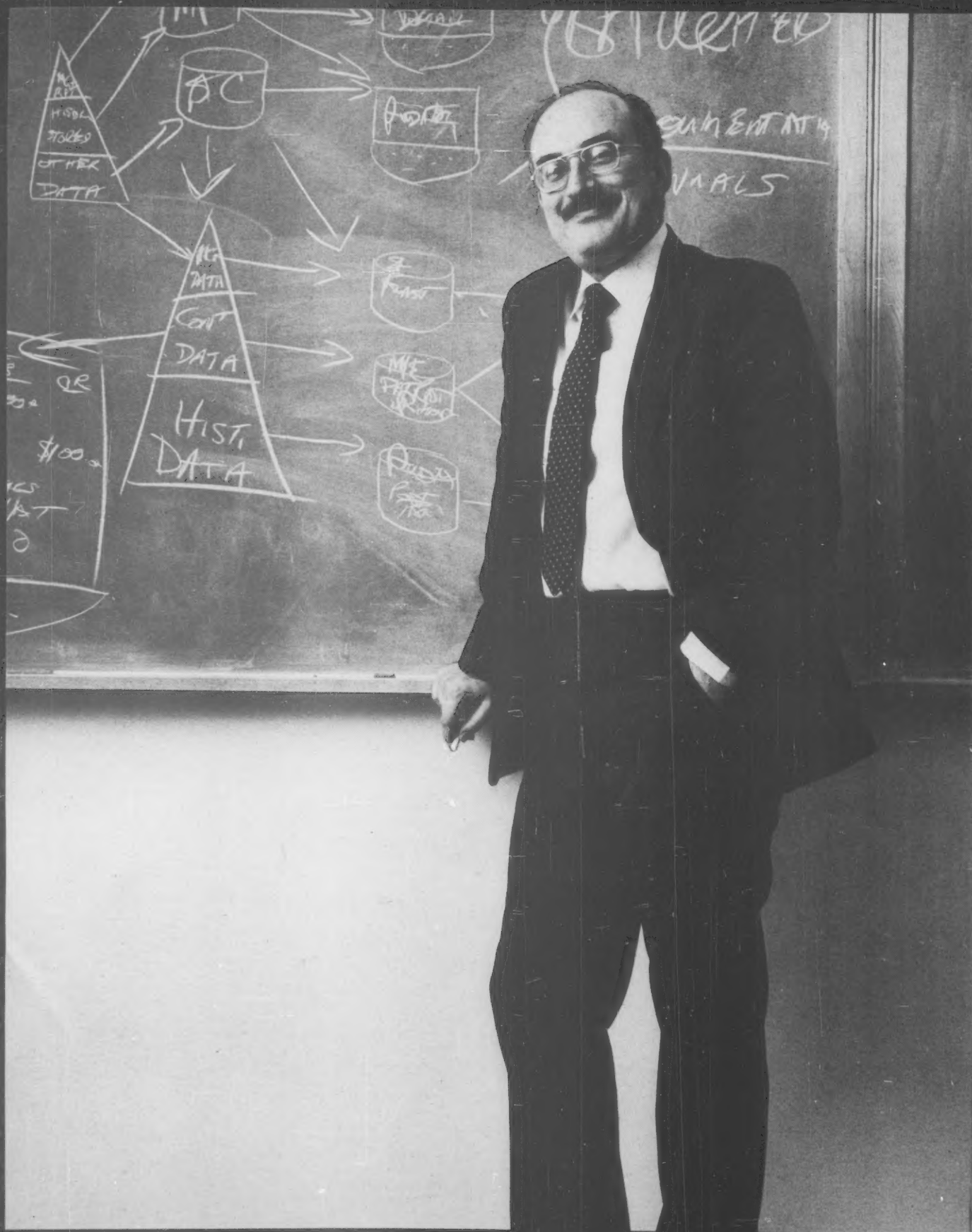
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Responsibilities Interconnected Users, DP Must Share Package Implementation

By Betty Brodie
Special to CW

It is a fact of life that vendors will not hold your hand and lead you through a successful implementation. You and your DP people have to plan and execute it yourselves.

You also cannot expect your responsibilities to end once you install that package. This five-step plan outlines the interconnected DP and user responsibilities for installing and using an application package.

The first step in any implementation is thorough, complete planning. The users first supply business objectives. Then DP people work with users to decide what hardware and software configurations will support the objectives. Because the user base is expanding and diversifying, acquiring a single package can affect a number of user areas as well as the DP department.

A package has to be simple enough to be usable, but robust enough to make its use worthwhile. It may require ongoing education and training throughout installation, testing, operation, tailoring and maintenance.

Basically, the application package addresses three tasks: it provides means for capturing data, tools to manipulate the data and access to the data so that it can be presented in forms that are of value to users. Only the user community can judge whether an implementation is successful.

To users, the performance and throughput qualities of the package are issues. Packages need to fit together as components of a strategic information systems plan. Users seldom care about technical aspects of application software; instead, they are concerned with the form and timeliness of the information it provides. Data processing people's plans support access to and analysis of information, prepare for changes and modification and supply user education and training.

	Planning	Compatibility	Installation	Access	Feedback
Users	Define business objectives Establish performance criteria	Identify user requirements Specify interfaces	Document user procedure Sign off on tested system	Identify access tools	Provide feedback
Data Processing	Determine hardware and software configuration Plan information systems environment	Define inputs and outputs Manage interfaces	Document operational procedures Control test process Prepare physical environment	Provide access tools	Manage changes and updates

Source: Arthur D. Little, Inc.

Application Package Implementation Responsibilities

During the second step of implementation, DP people define the package's inputs and outputs to assure compatibility with current systems and to enable future expansion. At the same time, users identify what they want from the specific system.

This study of compatibility assures that the package fits together with others or stands on its own. Clear definition of inputs and outputs from the application provides a path for future modifications and integrations, even if users and the DP department presently agree that the application is a stand-alone system.

Another aspect of compatibility concerns the interfaces between manual and automated systems. If the package supports only a limited range of the total functional requirements, interfaces between automated and manual procedures have to be identified and clarified. Users and DP people must agree in order to remove any misconceptions and set proper expectations about what the package will and won't do.

The DP department plans to maintain an integrated system in the long term while preparing single application package support plans for the short term. After a package is installed, the users need to be kept up to date with well-documented, timely enhancements and news releases.

It is critical that the DP department examine the integration be-

tween applications in order to recognize, document and manage all interface points. Only in this way will it be possible to maintain data integrity and prevent storage of redundant data.

Integration has to be soundly engineered. It should be designed to make maximum use of computing resources while supplying the data required for input to the application package.

Application interfaces provide pathways to channel data between applications and promote the development of valuable, believable information. The key is to identify the users who create or generate the needed data and to have one respon-

sible data source. This data can then be available for other users and user applications.

For DP, installation means preparing the necessary physical environment to enable the application package to run properly. This preparation may require additional hardware, storage, terminals or printers. It may mean installing communication lines or upgrading facilities. In addition, the application package may depend on some new system software or require technological expertise. This portion of the process is simplified if compatibility issues have been resolved in the planning process.

Installation also concerns defining
(Continued on SR/24)

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Support Needed for Management Software

By Anthony J. Viscomi
Special to CW

There are many project management software packages on the market, each with its own bells and whistles, input formats, terminology, screens, reports and some with graphics. However, no matter which one you choose, it will not contain the most essential elements for success.

First, and most important, realize that project management software is not project management. It is not an almighty planner, and it most certainly will not control. In short, it will not manage.

On the other hand, project management software is an effective tool in a complete and comprehensive program of project management. It is most effective where senior management is committed to planning, managing and operating a finely tuned organization. This applies to all types of projects.

How many times has good project management software been installed in organizations that are poorly managed, or lack even reasonable control and where management has provided no support or direction? How many times has this resulted in further dissatisfaction?

Far too often systems are sold and bought as solutions. They are installed and users are brought on-line. Shortly thereafter management comments, "but our projects are still over budget and behind schedule."

Systems are tools. Project management software is a tremendous tool in the hands of a skillful planner or dedicated manager.

This sounds apparent, in fact, to some it may seem ridiculously obvious. There are still those who believe, or at least manage their organizations as if they believe, that project management software is a cure for poor management techniques and an undisciplined organization.

Consider several steps before implementing a project management software package.

- Examine your existing organization.

Search in detail to reveal the obvious and subtle objectives, strengths and problems. Determine these on a behavioral level, as well as in product related areas. Analyze how projects are managed now. Perhaps they're not. How are priorities determined? How are project conflicts resolved? Who estimates and schedules

manpower? Most important, solicit feedback from various levels of the organization. Ask for improvements and solutions. Find out if your organization lacks project management, or project management goals.

- Adjust the organization to achieve project management goals.

If you find planning skills are weak, then you must educate planners. This might be the time to examine your work-order system, work breakdown structure or standard methodology, or possibly this might be the time to start using one. When this has been done, software can be implemented in a well de-

fined, documented and functioning project management environment.

An organization that is loosely structured and lacks existing management mechanisms will not benefit from a project management software system.

During implementation of project management soft-

ware, management participation and direction are keys to success. This is where most organizations strike out. Project planning and management must begin from the top down if project management software is to be properly utilized.

Directives must also begin
(Continued on SR/24)

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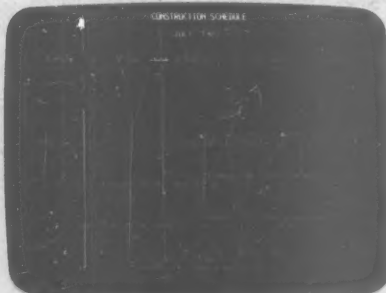
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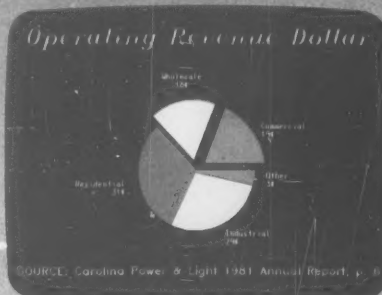
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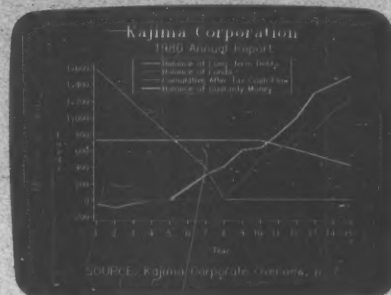
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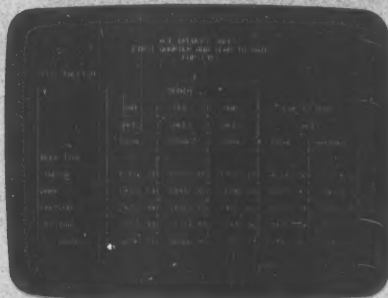
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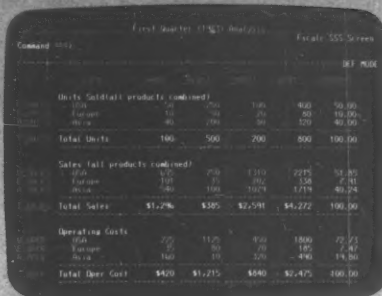
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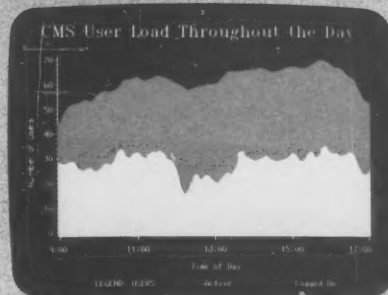
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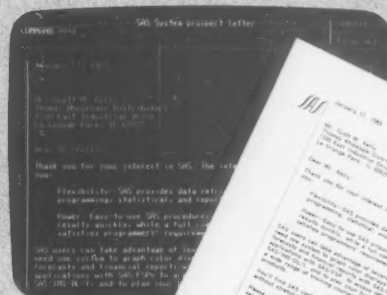
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SAS/FSP



Users, DP Must Share Implementation Tasks

(Continued from SR/20)

both DP operational procedures and user procedures. DP may have to "fit in" data backup or report generation and distribution. Users who have previously identified their needs for the package now have to match their working procedures with the package requirements. Together, users and DP people test packages to see that they perform acceptably. Only after this joint testing is completed successfully can installation be considered complete.

In the fourth step of implementation, users direct and DP provides. The users' major concern — access — includes all of the users' ways to work with data stored in the system. Access can consist of queries, reports, graphical presentations and/or "what if" questions.

DP supplies software tools to enable these accesses. Often, these tools are part of the application package, but they may also be separate access capabilities supplied by DP.

Users may have specific requirements — for example, on-line, interactive applications — or special timing requirements. Response time needs to be rapid enough so that a user's train of thought is not broken by operating the application. Using function keys instead of line-by-line entry assists in this area.

Users require initial training in the use of the application package. But once the application is learned, they may want to use shortcuts to reduce the interactive process. Multi-level help may meet this need, or the package may require continued interaction with training people until the users become comfortable with

handling data entry or screen access.

In the final step of an implementation, users provide feedback about the system and DP people respond with changes. Users issue change requests, reminders and assessments of performance. The DP department controls and manages changes and ensures consistency within the whole system. The DP department must be prepared for change and remain positioned to deal with it since users will continue to determine successful application package use.

Software support is needed to keep the application package up to

date. Most packages can be modified to accommodate particular business methodologies or to incorporate additional features. If changes are to be made, they must be made to the source code; however, no individual should make independent changes.

Some modifications may be very costly and time-consuming; they may not be worth the effort for the value they provide. Unless changes are well managed, they can be trouble spots.

In summary, installing an application package is more involved than just making the software available to users. Responsibility must be shared

between DP people and users.

In your implementation process, you should:

- Plan appropriate hardware and software to meet users' business objectives.
 - Integrate new and existing systems to ensure compatibility.
 - Prepare both physical environment and procedures to support application installation.
 - Establish appropriate user access.
 - Use feedback to manage change.
- Brodie is a senior member of the Information Systems Section of Arthur D. Little, Inc. in Cambridge, Mass.

Project Packages Need Support

(Continued from SR/21)

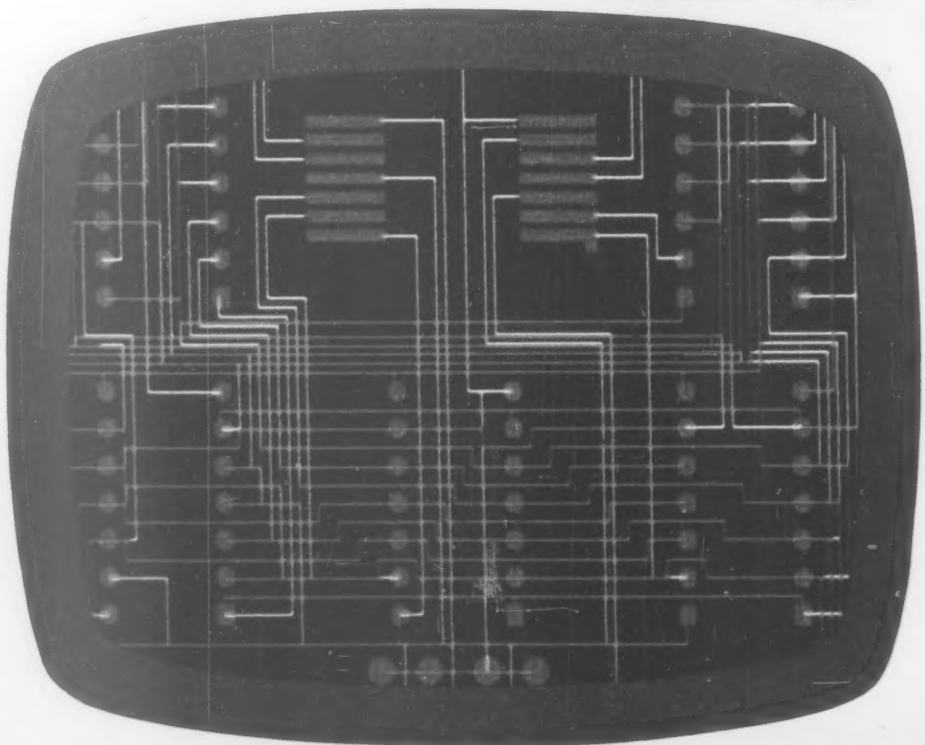
at the top. In one large organization the chief executive officer (CEO) addressed a pilot group of project leaders prior to a training session on their project management software. He clearly stated the corporate dedication to planning and managing and noted that all promotions would be based on the successful managing of projects. In fact, this CEO began his career at that company as a project leader. This is how credibility is established.

One important aspect of the implementation is the education of users. Training classes, understandable documentation, internal user groups and departmental coordinators are necessary to ensure the full and profitable use of your project management software.

In summary, it is necessary to consider the basics. Project management software is not a substitute for good management and skillful planning; however, when properly used, it is a powerful tool helping combine budget overruns, slipped dates and limited resources.

Viscomi is a client manager with International Systems, Inc. in King of Prussia, Pa.

DIGITAL'S VAX™ PLUS RAMTEK'S MARQUIS™ EQUALS:



Complexity Depends on Application

Package Installation Requires Careful Planning

By Peggy LeMoine

Special to CW†

You have met with user departments as well as upper management, mutually assessed your needs, appraised the offerings of a multitude of vendors, done cost/return studies, made your decision and your new application software has arrived.

Now you can get down to what the whole thing has been all about — installing your new system.

Or can you?

Is the research part of your task over or has it just begun? The answer

varies with the type of application you are installing, the degree of integration desired with existing systems and the amount of planned enhancements to the new system.

Applications packages can be classified in the following ways, according to the degree of integration and enhancing desired:

Load and Go Systems.

Unless you have just installed your first computer and this is the first system you are installing, you will not be lucky enough to have one of these.

Word processing packages sometimes fall into this category because the problem of integration often concerns the hardware only. User departments primarily are first concerned with storing documents, retrieving them electronically and increasing the accuracy and productivity of the clerical staff. Mailing list capabilities and other WP-related tasks that require using the existing data base often are not required.

If you have selected a WP package that has file handling and report generator capabilities, it may be nec-

essary to redefine the files using its facilities. This is often a relatively simple task that involves stepping through various menus and procedures that will prompt for record definitions, field names, element lengths and pictures. File definition and setup can be done by clerical staff in user departments. If programmers need to reformat existing data, it should require only simple conversion programs.

Install With Changes and No Integration.

Now here is a system the DP department can really get its teeth into. This system involves existing code, documentation, menus and procedures that require only a few finishing touches. There is no interaction with existing systems and no two-year production backlog. The system requires just one programmer and maybe an analyst to interact with the user department. An easy task — with the application up and running before you know it.

Or is it? Is the documentation as promised? Or is it sketchy, requiring analysis of base source code before changes can be made?

Narrative documentation that is separate from the code may not cover actual programs in enough depth to allow your staff to analyze the system in an acceptable manner. Source code may have to be studied and the interdependency of each program determined before any changes can be made.

This can seriously impact the time needed to get the system up and running.

Install With Integration and No Changes.

Changes and enhancements require definition and guidance from the user departments with the analyst interpreting user needs for the programmers. Integration requires far more participation from the user departments and more time and effort by the analysts to determine how existing procedures and data will be impacted by the new system. If the new package is from the same vendor and has been designed to go with existing installed software, programming changes theoretically should not have to be made.

The possibility of integration without any programming changes is remote, however. Even in adding applications designed to be part of a total system by the same vendor, you may find inherent problems in the new application. It may not have the level of detail provided in the base system.

Pressures of the marketplace preclude long lead times for products. Software producers and vendors provide the heaviest demand modules first.

For the construction segments of the market, payroll and related government and union reports might be offered first, followed by accounts payable and job costing. In distribution, inventory and accounts receivable are the "hot buttons."

(Continued on SR/26)

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What to Do When the New Package Arrives . . .

What do you do when the new software package arrives?

The first step is to review and re-evaluate the system.

- Is it truly load and go? If there is even the most remote possibility that the new system will interact with existing systems, data elements should be reviewed for compatibility.

- Are changes needed? Now is the

time to make them. Review and schedule as necessary. A short delay in installation now can save time and money later.

- Will the system be integrated with existing software? If immediate integration is necessary, are the systems truly compatible? Are data elements the same length and type, and are features in the existing system replicated in the new applications? If not, this system needs not only integration, but changes.

- All points of the system should be reviewed in depth to determine that desired features are available. The best way to do this is to get the

system up and running. Not only will this make management happy, but the users are sure to find any shortcomings.

Application review and comparison before the package comes in-house is the ideal. The reality is that it is unlikely that all points will be covered until the application is actually being installed and the end users have a chance to review the programs and procedures by working with the system. Errors in code and deficiencies in design are often not apparent from the demonstration runs prepared by the vendor. The best review and assessment comes

from utilizing the system.

If possible, insist that the vendor give you a period of time in which to review and, if necessary, reject the package. This will ensure that you can assess the system under the most stringent conditions.

This is not always a viable option, so it is then even more important that all major points be covered in the in-house review. The system is yours, whether or not further review shows that it is truly what you want. Failure to prepare for system deficiencies, or correct them, is worse than not installing the new system at all.

Getting Ready For Installation

(Continued from SR/25)

In both instances, if the detail is computerized, it is relatively simple to extract figures for the general ledger, so this might be the least item in demand.

Software houses, responding to these various demand levels, would produce the general ledger package last, almost as an afterthought, and might not build the features demanded in the earlier systems.

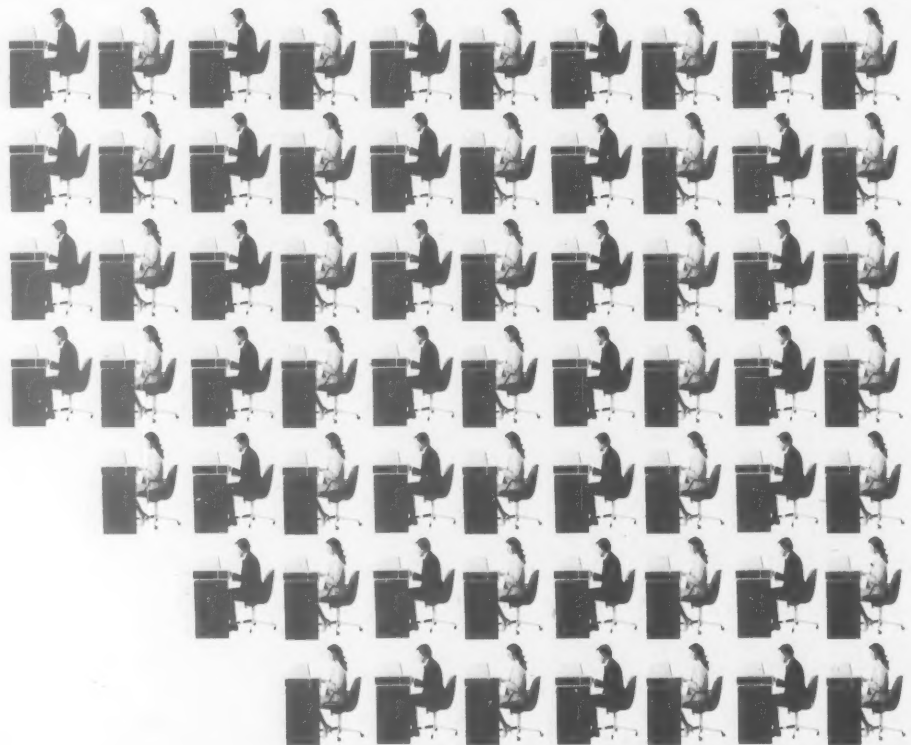
Install With Integration and Changes.

Even with vendor-integrated applications, changes are sometimes necessary to conform to modifications made in previously installed modules or to enhance the base system.

The ideal system utilizes a single data base with repetition of user function for ease of learning and has user-defined parameters for the maximum number of functions possible. It is doubtful if anyone has achieved these lofty principles, but every management information system should have these as the ultimate goals.

Integrating a package can require almost as many resources as a "scratch" in-house system. The most basic functions will be in place and should require only minimal programming changes, if any, to accommodate changes and enhancements. Otherwise, you have picked the wrong system.

LeMoine is vice-president of finance for Swengel-Robbins, Inc., a pipeline construction company located in Scottsdale, Ariz.



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'Uh, Oh . . . Looks Like a Bug in the Program.'

Software Integrates All Systems

Phoenix Package Manages City Finances

PHOENIX — Like many Sun Belt cities, Phoenix has benefited from an influx of people and business in recent years. As the city grew to become the ninth largest metropolitan area in the country, officials began to look for a large computer system and application software to better plan, control and report the city finances.

A request for proposal developed in July of 1981 specified compatibility with a large Honeywell, Inc. system and state-of-the-art data base and communications techniques. The targeted starting date was early

December 1981 with an implementation date of July 1, 1982.

Functional requirements included the adoption of a new and expanded accounting code structure, a base budget system, management reporting, detail audit reports and balancing features, on-line inquiry and input capabilities, improved accounts payable functions and an increased level of supportive detail data, according to Michael Norman, Phoenix project leader for the Financial Management System (FMS).

Norman's team planned a "Detail

Requirements Review/Planning" milestone, including training, software package installation and test, systems tests, forms and procedures development, start-up and implementation and a postimplementation audit.

Peat, Marwick, Mitchell & Co.'s Famis package was selected in September from three bids submitted. Review sessions, geared to understanding the Famis package, were conducted during October and November 1981. Detail modifications and enhancements were defined and

tagged either "mandatory" or "desired," according to priority.

The city refined the project organization to include a steering committee, project director, project manager, project consultant, user project leaders and a management information systems (MIS) project leader.

By December, a software conversion effort was under way to modify IBM CICS programs to Honeywell Idsii/DMIV data base program and files. In many cases, logic rewrites were required, which turned out to be more difficult than expected, Norman said.

Meanwhile, the project team was wrestling with scope, objectives and priority issues. As requests for modifications and enhancements increased, "we jealously protected the base-line package from any but the most essential modifications," Norman said. "All enhancements and lower priority modifications were assigned with separate resources and moved out of the July 1 critical path."

The most significant "enhancement" was the issue of integration, Norman said. The city of Phoenix had 12 automated systems that would interface with, and provide input for, the financial software package. The question was whether the interface would be a conversion of old to new codes — either a "full interface" requiring all originating systems to be modified to input and process the new financial codes, or some type of a compromise between a purely back-end conversion and full integration.

The issue of integration was independent of the software package both functionally and contractually, Norman noted. Yet upper management had originally envisioned a fully integrated system in the initial implementation.

With advice from Janett Smith of Peat, Marwick, Mitchell and after resource and objectives identification and analysis, a decision was made in December to fully integrate all current systems with Famis. The July 1 implementation target date remained unchanged, although the degree of effort increased from six to 24 full-time employees to modify the 400-plus programs and achieve a totally integrated FMS.

In January, as the IBM/Honeywell conversion was nearing completion, the city revised its project plan and staffing. The MIS staff was organized into five teams with senior staff responsible for specific and discrete tasks. Detail plans were developed and reviewed with each team, then summarized for the project team into a number of key deliverables or tangibles.

By March, Famis had been converted to Honeywell, and a data base technology and the basic software had been tested. User training and working sessions continued, and forms changes and data entry procedures were defined. Over 100 forms were revised and reprinted.

(Continued on SR/30)

Alpha Micro introduces its 68000-based line of systems.

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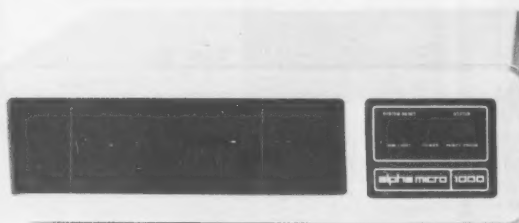
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Firm Learns Value of Backup

LONDON — In choosing software packages, support and service often take a backseat to the search for flexibility and functionality. But users shouldn't neglect to focus on support and service.

United Medical Enterprises, Ltd. (UME), a London-based company operating internationally in the health care market, learned this lesson the hard way. The firm initially purchased an accounts payable subsystem from a UK vendor firm and

the company was having "after-the-sale, how-do-we-operate-it blues."

The fault did not lie with the initial purchasing decision, but with the problems incurred once the system came in-house. The transition was anything but smooth, and left UME's DP professionals and users with a good, solid system without vendor backup, according to David Williams, DP manager for UME.

Williams explained it this

way: "After an extensive look at all the software products in the UK, we settled on this accounts payable subsystem. The system proved difficult to operate. This was surprising to me because I thought we had purchased the best system available in the UK."

Williams still feels the system itself is good, but "the people who came to install it were not up to expectation. So much so, that I began to doubt their ability."

UME then made the decision to suspend implementation with this particular vendor firm. At that point, UME needed an accounts payable system and needed it fast. It had already exhausted software resources in the UK and, because time was of the essence, it couldn't begin another lengthy evaluation process.

Williams attended the 1982 annual Hewlett-Packard Co. users group convention in San Antonio, Texas. "While there, I learned HP's General Accounting Package had been developed by Collier-Jackson, Inc., a Tampa, Fla., firm."

Williams called a Collier-Jackson marketing representative. "Because we knew exactly which parameters we needed, I realized from the phone conversation Collier-Jackson's FPS/3000 would meet 80% to 85% of our needs," he stated. "But I couldn't rely on a sales pitch alone, so I made immediate plans for me and our disbursements accountant to make an on-site visitation."

Decision to Purchase

UME made a decision to purchase Collier-Jackson's accounts payable system during the initial visit. The solution to its problems included systems education, maintenance and support.

UME was undergoing a complete staff change in its accounts payable department. No parallel run would be permitted because the company stopped all input into the old system, paid its outstanding invoices and shut the old system down.

Collier-Jackson's on-site installation team not only had to get the system on-line and new people trained, but also had to rebuild UME's confidence in software vendors at a time when the old adage, "Let the buyer beware," was up front in the minds of UME's DP professionals and users.

For a new computer system, the implementation period was remarkably fast, Williams said.



P. 28/110-

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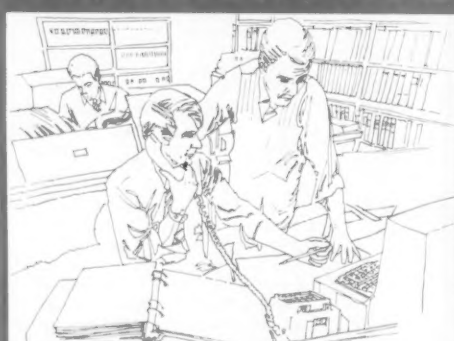
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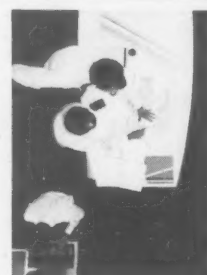
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Recently, the Merlyn Corporation completed the industry's first exclusive study* on eight available ADS software systems. And this study clearly confirms what Cincom users already know. MANTIS is decidedly the winner.

Among the three most widely used systems—MANTIS, DMS and UFO—MANTIS led every user satisfaction category: productivity enhancement, on-line performance, ease of learning, ease of use, documentation, support and reliability. And in the most important category—"Overall Capabilities"—MANTIS was again the winner.

User satisfaction? 33% of DMS users said they would *not* recommend their system to others. Among UFO users, 6% would *not* recommend theirs. For MANTIS users, not one single user said no.

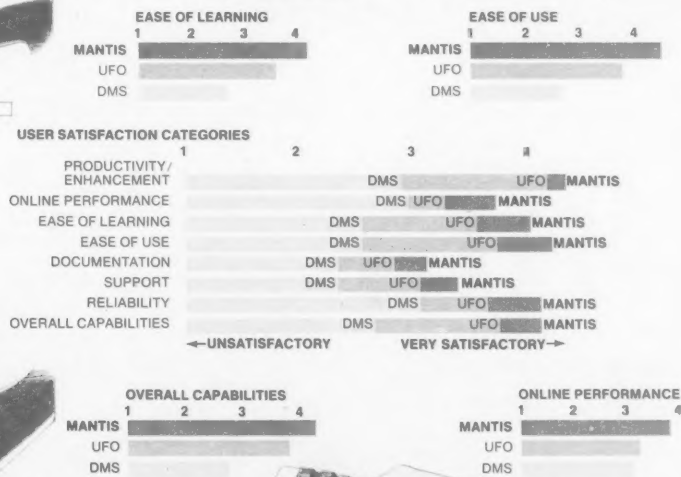
Further evidence of MANTIS' superiority is the overwhelming industry acceptance. In only 18 months since its introduction, MANTIS has gained 11% of the total ADS market share. That's a substantially higher growth rate than all of the other seven systems studied.

But while we're very pleased to be the runaway winner, we're even more pleased that MANTIS is becoming the industry standard for on-line programming. 84% of MANTIS users develop 91-100% of their applications with the system. Only 67% of DMS users reported such high usage. With UFO, the figure plummeted to only 48%.

These are merely the highlights of the conclusive Merlyn Study. But the findings are clear. When it comes to application development systems, MANTIS is in a class by itself.

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*CICS Application Development Systems: The Comparative Consumer Report. Written and published by MERLYN CORPORATION. Survey data from Focus Research Systems, Inc. 1982.

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Manufacturer Profits With Accounting Package

OSHKOSH, Wis. — "Anybody's box can add, subtract and crunch numbers," Patrick Esslinger of SNC Manufacturing Co., Inc. here said. "What a buyer needs to ask is: 'How much effort will be involved in modifying this company's software so it will do things the way we want to do them?'"

As Esslinger sees it, users are now much more aware than they used to be, recognizing that the software the manufacturer delivers with its machine, or the software that it purchases elsewhere to run on the new system, is tailored so it is more or less suitable for everybody. "It's the

'more or less' that's the Catch-22," he said. The process of adapting the programs to meet the company's specific requirements may take months and can be the most frustrating part of the process.

The answer, according to Esslinger, is to make the question of software flexibility a major factor in

the computer purchase decision.

SNC Manufacturing produces customized electrical transformers, especially for use in the control of computers and medical equipment. Started in 1946, the company now has 250 employees, divided between the main plant in Oshkosh and a second production facility in Emmets-

burg, Iowa.

In June 1980, SNC purchased a Basic Four Corp. System 610 from Management Assistance, Inc. and a software package called Profit from Computer Methods. The main reason for the latter selection, according to Esslinger, was that Profit software

(Continued on SR/34)

Phoenix Grows With Financial Package

(Continued from SR/27)

"As May drew closer, our pace became more intense," Norman continued. All but the high-impact and

most beneficial enhancements were deferred so as to maximize resources available for the base-line Famis and integration effort.

One of the enhancement objectives was the development of a budget system to replace the former preparation and monitor budget system. Also, approximately 15 reports, a communications security module and five inquiry screens were added. This was accomplished with separate resources justified individually and operating outside the path of the integration/base-line software implementation, Norman noted.

By June the city was system-testing the software and most of the interfaced systems. Slippage had occurred in a few of the current systems to be modified and integrated and in the accounts payable subsystem of Famis. Some problems were related to fine tuning the data base and to increasing file sizes that were originally underestimated. "We were overwhelmed with high-volume test results, but worked with the users to review specific results based upon defined discrepancies," Norman said.

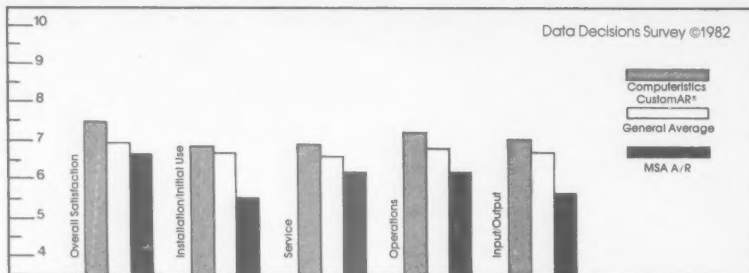
Recognizing that testing could continue indefinitely, the project team determined that all critical test results had been reviewed and approved. The Steering Committee concurred and the FMS project was implemented July 5, four days behind target.

There were very few application program errors at implementation, few training or input problems and modifications to the current system appeared to be complete and effective, Norman said. "This was a result of Peat, Marwick, Mitchell and our staff's diligence," he said. "There were some anxious moments in July and August, such as delays in shaking down some interface programs and processing times that exceeded one shift. However, the implementation generally occurred as anticipated and planned."

The DP staff remained until October, developing additional reports and budgetary enhancements. The entire project achieved a variance of within 10% of its planned vs. actual staff and cost.

"In my opinion, the greatest advantage to purchasing and implementing a software package is that it encourages modifications to take a lower priority to the implementation date; hard decisions are forced. The greatest danger is to underestimate a software package implementation effort — to gloss over the requirements and objectives, to minimize resources required and to underestimate the desired modifications and enhancements. Packages are a double-edged sword, result-oriented, but so easily underestimated," Norman said.

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The Pizza Time Players trade jokes and sing in the dining room at Pizza Time Theatre. Behind the scenes, Xerox computers and an IBM 4341 mainframe call the administrative shots.

Food Chain Chooses In-House Package

SUNNYVALE, Calif. — Add Disneyland and Disneyworld together. Divide the sum into neighborhood amusement parks complete with computer-driven characters, video games and dozens of children's rides. Offer pizzas, a salad bar, beverages and an assortment of hot sandwiches.

What do you have? Chuck E. Cheese's Pizza Time Theatres, established by Atari, Inc. founder Nolan Bushnell. About 200 outlets already dot the U.S., with additional stores opening at a rate of two per week.

The corporation is mushrooming so rapidly that since incorporation in 1977, it has expanded to 7,000 employees, outgrowing its Bay Area headquarters nearly once every year. Yet it recently faced the prospect of picking a new information processing system that would stand up for five years or more.

"We had reached a crossroad," John Impson, Pizza Time's vice-president of manufacturing, explained. "We had been using two sources — Xerox [Corp.] Computer Services for on-line processing for our manufacturing and distribution data while a local service bureau provided processing of our financial matters, mostly on a batch basis.

"Unfortunately, the service bureau could not keep pace with our needs. Three to four weeks often elapsed from close of month to delivery of corrected key reports important to us and to our financial department."

Late in 1981, the company invited bids for a new, combined service. The request stressed the importance of application software that could be run initially as a service and then transferred to in-house hardware.

According to Impson, system inte-

(Continued on SR/38)

System Eases Changes for Manufacturer

(Continued from SR/30)

could be modified.

SNC previously had been using a system that was dedicated to handling accounting chores only. The firm had recognized a need for installing a computer system for production control as well.

Citing examples of Profit's flexibility, Esslinger explained that its files have been set up with open fields, so that if the user has to hold an extra piece of information, the open field already exists. SNC was concerned with the time that was being taken for order processing. To understand where the delay were occurring, the company added a capability for tracking each order through the system to the software program, recording in whose hands a particular order was at any moment, how long each person had it and so on.

Another important change was the inventory package. For tax reasons, the company operates on a "last in first out" basis, and the process of modifying the software from the more common "first in first out" was simple to do. "I think with most other software packages," Esslinger explained, "that kind of change would have been an enormous problem, the kind of situation where you get to wondering if maybe it's easier to change your business practice than change your software."

SNC's original system, the Basic Four System 610, offered 96K bytes of main memory, two 35M-byte disk

drives, four terminals and one 300 line/min printer. From the time it was first installed, the system provided the company with added capability for scheduling and monitoring production and integrating the accounting and job-control functions.

To ensure a smooth transition to the world of computers, SNC established a computer steering committee to explore the field and select a system. This committee was made up of the company's top-level managers, which created a means of getting involvement and support from every department. The existing staff was trained to use the new system and, according to Esslinger, "people were enthusiastic because they saw it would make their work easier."

In the two years since installing the original system, SNC has upgraded to a Basic Four System 730. The removable-pack disk drives were converted on-site to units with 75M bytes each, a total increase of 80M bytes of memory. The main memory was increased in increments to the present 288M bytes. The number of terminals has been increased to 16, including two terminals used for word processing as well as data processing.

"Another feature of this system is that it can be upgraded so easily. We've already doubled the capacity, and we can upgrade still further from here — all on-site."

The Profit software has produced some advantages that SNC had not expected. For example, the firm now

uses the system for performing selective marketing analysis. "We crunch through the sales data and find what types of transformers are selling the best. Then we go through the customer data base to find similar types of customers who might be interested in buying that same type of equipment," Esslinger said.

In addition, the company designers have simplified the product line by having the system review the engineering data to discover transformers with similar design functions that could be combined.

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41 functions and 66 commands. And if you include data base and graphing commands, it actually has 110!

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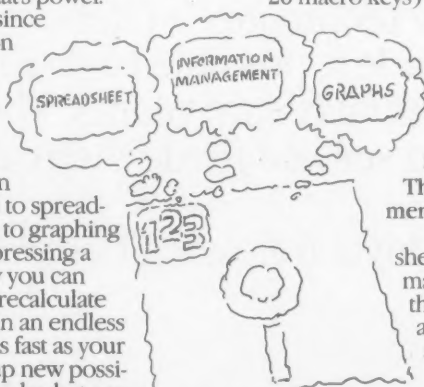
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These were the first days of Cullinane Database Systems.

Their first products were revolutionary in the sense that they brought the data processing world to a new way of thinking about the staggering amount of information they processed daily. Products such as IDMS recognized that data was a very dynamic entity – not something you stored away or carried about in voluminous paper print-outs.

Enhancements led to new techniques in data management. Programming aids made it possible to develop products uniquely tailored to individual requirements. Thorough documentation, testing, support and service made them a leader in the database world.

And thus, their small and loyal following became

a large and loyal one.

But in the minds of the small group of people who first proposed a rational approach to the database, the challenge hadn't been met. If anything, it had grown more diverse.

So the decision was made to put the Cullinane Database Systems name behind them. And replace it with a name that reflected a broader and fresher approach not only to database management but to the thorough integration of data throughout the entire corporation. The name is Cullinet.

You won't see Cullinane Database Systems anymore. But you'll feel its presence and you'll see the mark of its thinking in many new areas.

You'll see some very dramatic introductions in the area of personal computer software. In applications software for manufacturing and financial management. In decision support systems. In fact, there's little that isn't included under their broad net.

Cullinet. In many ways it's the same company. In many more ways, it's a better one.

So you can look at this as Cullinane's last ad. Or as Cullinet's first one.

Cullinet



Chuck E. Cheese

Food Chain Motivated to Integrate

(Continued from SR/34)
gration was one of the most significant user requirements requested of the software supplier. "For example, efficient inventory management is vital to our profit picture," he noted. "Yet when we had separate financial and manufacturing systems, we found it impossible to re-

solve differences in inventory records."

About one-half of the Pizza Times are company owned; the others are franchised. But virtually all follow similar merchandising.

After deliberation, Pizza Time let a contract to Xerox Computer Services for the Xerox Manufacturing Sys-

tem, an integrated package of manufacturing, financial, distribution, marketing, engineering and procurement functions. The software is compatible with all IBM 370, 4300 and 30 series computers and operating systems.

Load Expected to Triple

For three years, Pizza

Time used the Xerox Computer Services on-line service consisting of six major application programs: accounts receivable, cost planning and control, inventory management, order entry and invoicing, sales analysis and material requirements planning. But the load on the integrated system was expected to triple when financial services were added.

Communication with Xerox's Los Angeles data centers was accomplished with three Xerox 1350 minis, 26 Xerox 1340 terminals and four slow-speed line printers, according to Steve Merchant, Pizza Time's management information systems director.

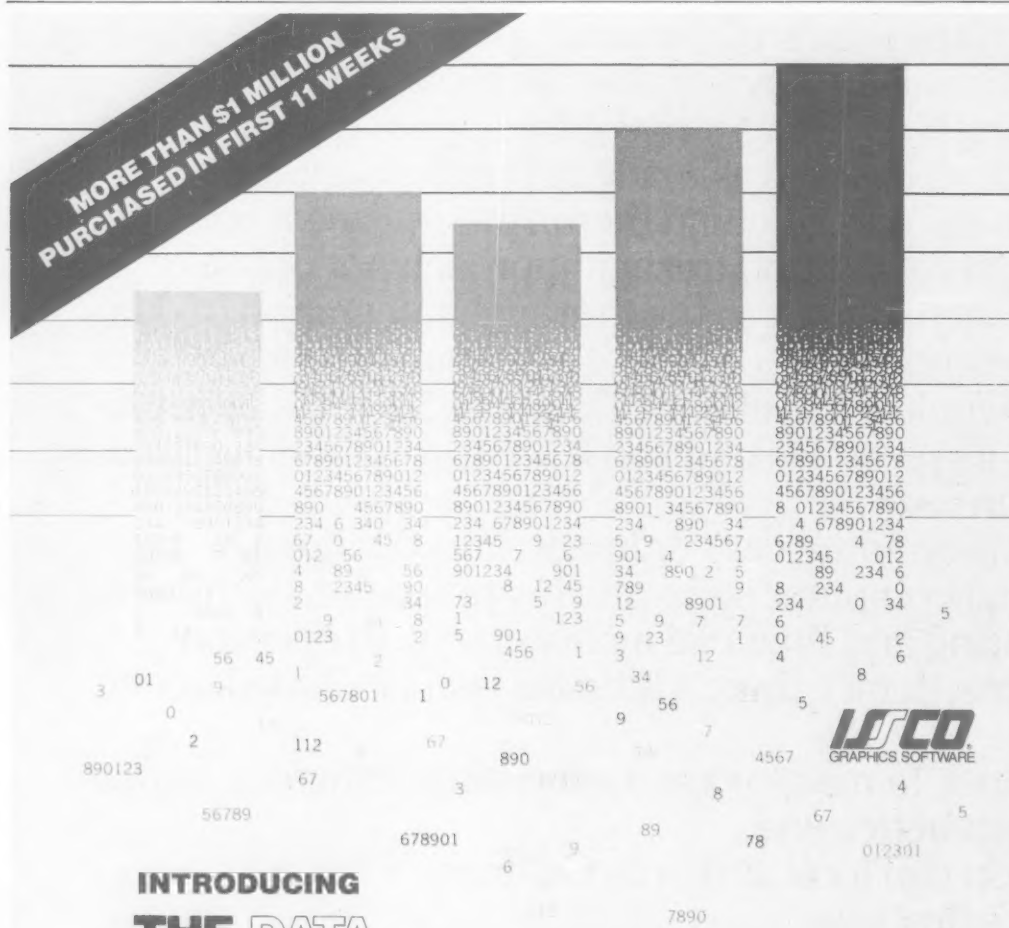
"Under our new contract with Xerox," Merchant explained, "they are providing the new Xerox Manufacturing System with procurement management and master production scheduling, as well as fully integrated financial systems for general ledger, accounts payable, receivables management and fixed assets."

By mid-February 1983, Merchant was expected to have his IBM hardware installed. The mainframe selected was an IBM 4341 Model 11, with 4M bytes of memory. Peripherals will include three 820M-byte Model 3375 disk drives, two 3420 tape drives, one 3203 1,200 line/min line printer, one 3705 communications controller, four 3274 communications control units and 40 3278 and 3279 terminals serving four different company locations.

Merchant's department is also responsible for the time-keeping and other functions of a point-of-sale system in each company-owned store. To poll and process store data, Merchant uses a Digital Equipment Corp. PDP-11/24 system.

"With this approach, we can move the Xerox software in-house with a minimum of risk," Merchant said. "And the Xerox software can move across IBM product lines, so we will be able to stay with the same software even if we change processors."

Admitting that Xerox Computer Service was not the cheapest proposal considered, Impson ventured that system integration and future expandability had been weighed at least as heavily as short-term payback. "If we continue to grow at our present rate, we may have problems by 1985 or 1986," he said. "But they'll be hardware problems, not software."



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Manages Personnel Information for 30,000

PMS Package Ups 'People Productivity' for Firm

SAN FRANCISCO — A software package is helping the Bechtel Group of Companies manage its most valuable asset — people — during this difficult economic time.

According to Sidney H. Simon, manager of personnel information systems and procedures, the firm's central personnel department has "set the standards for the company" and ensured that the "personnel function has the tools to do the job."

The package the firm is using is Tesseract Corp.'s Personnel Management System (PMS), which was implemented under Simon's direction on an IBM 3033, Bechtel's internal computer.

Bechtel has progressed from a centralized data capture and reporting personnel function to decentralized updating and reporting. The firm has eliminated the filing and retrieval of approximately 36,000 documents, freeing people to perform more interesting and productive jobs, Simon explained. In the process, the quality, timeliness and availability of personnel information has reached an all-time high.

It is a real benefit to "obtain information close to its source and have information where it needs to be," Simon said, adding, "that means the decentralized division personnel organizations are directly responsible for their information."

Before PMS

Before PMS, the automated personnel system ran weekly updates, and all personnel information for the nearly 30,000 worldwide Bechtel employees was processed by central personnel. Fifteen full-time clerical people were responsible for receiving the information from the divisions, preparing it for keypunching, auditing error reports and making the corrections the following week.

The old system provided monthly reports. "The timeliness and accuracy of information was totally unreliable," Simon said. Many operating divisions would send personnel changes near the end of the month. If there were errors in the input, the information could not be corrected until the following week. However, reports were still generated at month-end so correct data might not appear on the reports until the following month, he explained.

Today, most personnel information is input by the operating divisions. "We want to collect the information as close to the source as possible," Simon reported.

The central personnel clerical staff has gone from 15 full-time employees to six employees who have numerous job responsibilities, only one of which is to maintain this personnel information for the centrally processed Bechtel divisions.

The operating divisions had reservations about decentralized processing, Simon said. They believed that it would mean additional responsibilities and staff. "We have proven that there have been no additions to anyone's decentralized staff for either

reporting or data entry. Instead, job content has been enriched through the use of terminals rather than typewriters," Simon said.

Since his department is responsible for personnel procedures as well as the PMS, when the decision to decentralize was made, Simon's department prepared the operating divisions. "We reviewed their existing procedures, then showed them how their procedures would and should change to do the job better using the system. We were able to identify one-half of a person here or one-

quarter of a person there to perform the specific functions," he said. It took less than two days to train people to perform the necessary personnel functions in PMS.

Central personnel maintains control of the system and serves as a single source for companywide personnel information. Only this department can access the entire Bechtel employee file. Simon's group determines what information can be read and updated by each user of the system, so decentralized divisions only have access to their employees'

information.

Updating employee information has been streamlined from what it was before PMS. "In the old days," Simon explained, a clerk had to go to an employee's file, extract the document from the last action update, have the change made on the document, obtain the necessary approvals and send the document to central personnel where information would be updated weekly.

Simon described today's updating procedures this way: "When an oper-

(Continued on SR140)



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Firm Strikes Oil With CPU, Accounting Package

OKLAHOMA CITY, Okla. — What does it take to achieve a successful installation of a software package on a newly acquired CPU?

At Clements Energy, Inc. (CEI), an oil and gas exploration and production company here, the three key factors were "the dedication and teamwork of the implementation project personnel; the proven performance of the hardware and software; and the "excellent communications maintained" between the CEI and the software vendor.

Contracts were signed in February 1982 to purchase a Hewlett-Packard Co. HP 3000 Series 40 computer and Petroleum Software Systems, Inc.'s (PSS) Integrated Petroleum Accounting System. CEI and its parent company, Nerco, Inc. of Portland, Ore.,

had conducted an extensive requirements study and mutually agreed this would be the best combination to meet the needs of the growing company, senior systems analyst Shirley Handley explained.

"Organization of the im-

plementation project team and planning the strategy became a logical extension of the cooperative spirit that had prevailed during the requirements study," Handley said. CEI had been using an outside service bureau to process accounts payable,

joint interest billings, accounts receivable and general ledger for about a year. The firm had been less than satisfied with this service, and other areas it had hoped to automate were still using manual systems.

CEI management recognized the need for DP expertise from the corporate management information systems staff, and CEI personnel were highly motivated to participate in the implementation to assure an accounting system that

would work well and allow optimum control of schedules, she explained.

The scope of the project and a very aggressive schedule was dictated by management, Handley recalled. The priorities were to convert the service bureau applications as quickly as possible, to automate the manual revenue distribution process and to phase in expanded accounting capabilities. Nine comprehensive accounting modules were to be up and

(Continued on SR/42)

PMS Package Improves Productivity of Personnel

(Continued from SR/39) ating division wants to process an action, it prints a document with the current information then and there. It makes whatever changes it wants to, gets them approved and inputs these changes to the system. The division doesn't print another turnaround document until the next action is required. The

result is you are never going to the file to get a document or putting one back in the file for next time — the system is really used as a file cabinet."

For Bechtel, the prime benefit of PMS "is improved performance of the personnel function." Bechtel's future plans include greater use of PMS.



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SLIPPERY SCHEDULES, AND AVALANCHING
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Firm Handles Contracts With Project Manager

ST. LOUIS — A project management package on a minicomputer helped J.S. Alberici Construction Co. here handle more than \$800 million in new contracts in 1982.

One of the largest general contractors in the country, Alberici uses T and B Computing, Inc.'s Track 50 project management system, which runs on Prime Computer, Inc. 32-bit minicomputers.

After a thorough investigation of many systems by a special Alberici task force, the Prime/Track 50 combination was found to offer the most effective solution.

The Alberici installation was configured with a Prime 250-II with 2M bytes of memory, 300M-byte and 96M-byte disk drives, 1,600 bit/in. magtape, California Computer Products, Inc. (Calcomp) and Zeta 4-pen plotters, Calcomp digitizer, terminal workstations, printers and extensive digital communications equipment.

System's Challenge

The system's challenge was to aid project management in a successful and growing organization where employee productivity was already high and business practices innovative. Results have been extremely beneficial, according to Gene Novacek, manager of Alberici's Management Information Systems Department.

"The system has to have the flexibility to let us extract only what we need from an extensive bank of project information. All too often, management gets flooded with too much information, which clouds the decision-making process. A high degree of organizational and summarization power is also necessary to present the information in a consistent, understandable format. The Track/50 Prime combination gives us this and more," Novacek explained.

Alberici has been able to meet the challenge of an important industry trend — combined cost and scheduling of project management systems. Controlling large-scale building projects means the company may be responsible for overseeing as many as 250 subcontractors with monthly billings as high as \$40 million; and often, there are many large-scale projects going on at the same time.

"Getting subcontractors to agree on a monthly invoice amount was tough enough, let alone trying to get them to work with us as a team," Novacek said. "Voluntary information from subcontractors can be very valuable in projecting time and month problems. Our procedures actually help to kindle a team spirit among all parties and maintain that spirit over the course of a project. The by-products of this effort are 'meaningful' schedule projections, cash flows, manpower and resource requirements, not to mention valuable historic data."

"The accuracy and timeliness of our information means project managers and engineers can be more effective in preventing problems be-

fore they occur, thus creating a more controlled project environment to everyone's benefit," he added.

Terminals, printers and even graphics plotters are often installed on-site at large construction jobs. Prime's communications capabilities and the Primeret networking facility are being used for remote accessibility. The 2780/3780 emulator and remote job entry workstation facilities are also used to link the Prime 250-II to an IBM 4331 used for payroll, gen-

(Continued on SR/46)



Alberici's Novacek compares status data against milestone schedules.

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VM Software Inc.

Oil Firm in the Black With CPU, Package

(Continued from SR/40)
running by year-end.

Meanwhile, lease-records personnel were concentrating on organizing manual records in preparation for implementation of a major lease records module to support management of an inventory of more than 5,000 leases.

CEI constructed a computer facility, installed the HP 3000 and completed all off-site education by April 23. Key project personnel spent four days in mid-May at the PSS offices to complete a 50-page questionnaire that was to become the single most important piece of documentation.

"Listed in one small binder were all the decisions that made our system unique from any other PSS customer," Handley said. "The ball was now in the PSS court, as it built all the necessary system-control tables and methodically checked the results of the tailoring with the same test data we had seen

demonstrated in our training classes."

The petroleum software systems package was installed on CEI's computer on June 23, and the installation accountant spent two days reviewing the results of the acceptance testing with CEI's personnel.

The next milestone on the

critical path was an August parallel for the service bureau applications. "Not only did CEI make its August deadline, but the parallel went so well that those applications moved into production on the in-house computer as of September," Handley said.

Revenue distribution completed a test cycle, duplicating a full month's manual checks, and went into production in October. New capabilities continued to be phased in through the remainder of the year. At year-end, 85% of the accounting processes were in production, Handley noted.

A great deal of behind-the-scenes planning went into reducing effort to the bare-bones minimum necessary to achieve the desired result, she said.

The implementation approach included a philosophy toward program changes vs. a project enhancements log, file custodians and file conversions, responsible users, the test account, shakedown testing and the PSS Phone-In Consulting Service.

'As-Is' Basis

Because DP production systems were desired in the least amount of time, management made a decision to implement the software as closely as possible to "as-is." The minor modifications that were required were accomplished by PSS with fast turnaround times, either under warranty or within the provisions of its program product support agreement, Handley reported.

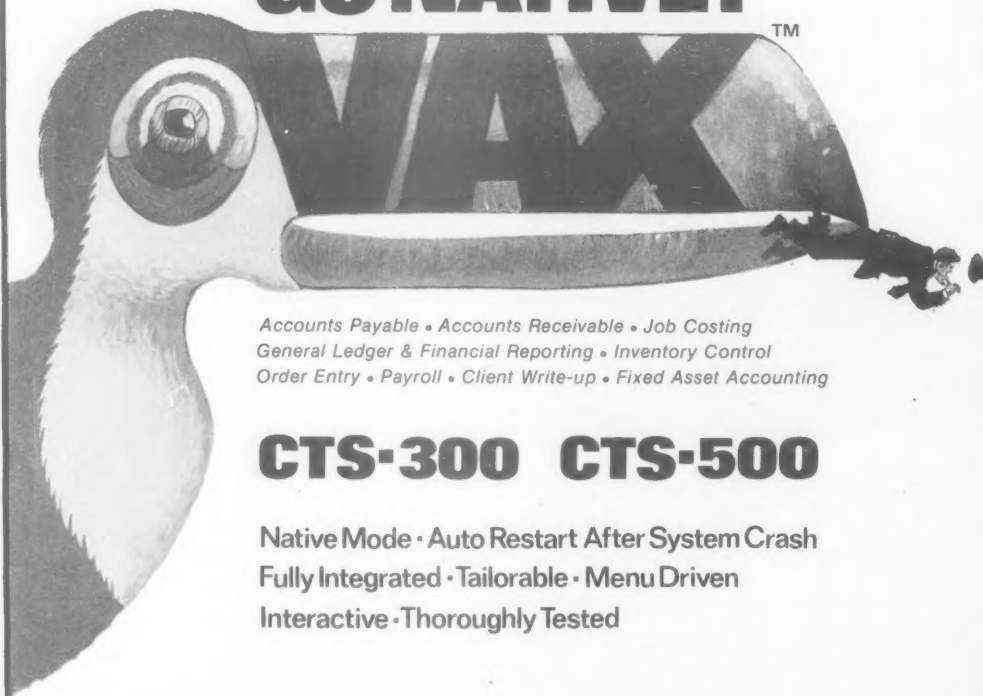
An appropriate user was assigned to be file custodian for each file required, having responsibility for his data being ready to use by an assigned due date and also for preserving the integrity of that file's ongoing maintenance in the production environment.

The vendor's acceptance testing proved that the tailored software installed on the CEI computer had worked with PSS test data, Handley said. When the structure was installed for live data processing, an identical test environment was created. DP people were assigned to do "shakedown testing" in the test account with representative samples of live data.

"By the time jobs were moved into the production account, there was a high degree of confidence that they would operate correctly," Handley explained.

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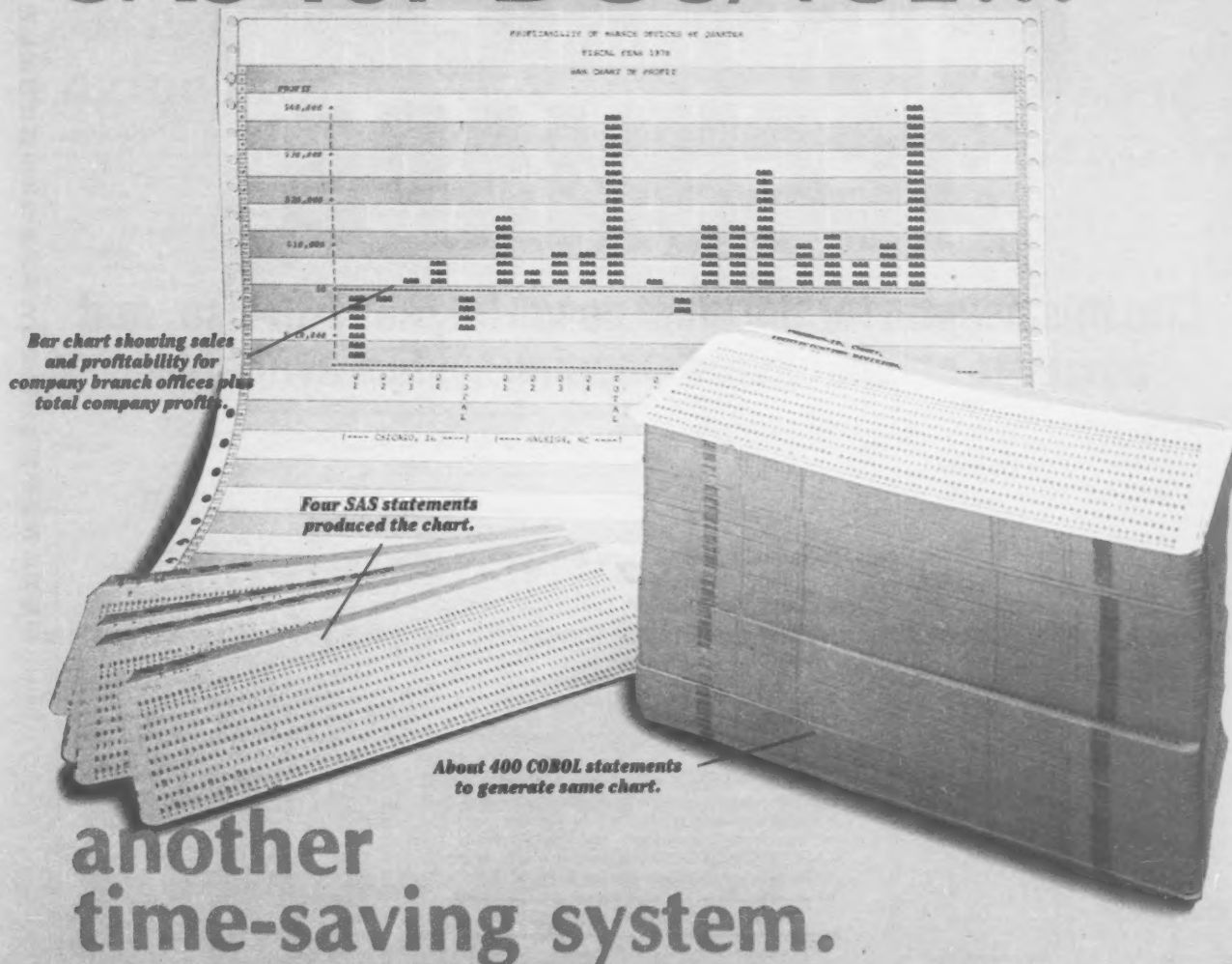
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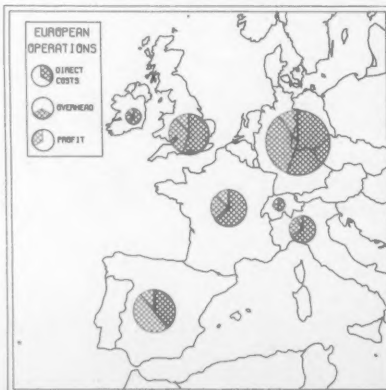
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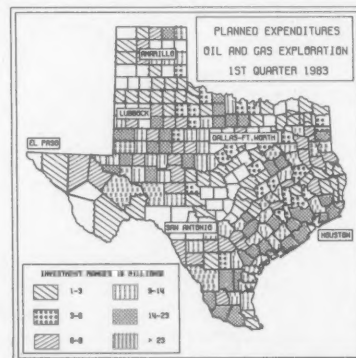
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Engine Firm Saves With Distribution System

COLUMBUS, Ind. — Sometimes packaged software does not provide the best solution to an organization's DP problems.

For example, when Cummins Engine Co. here decided in 1978 to establish a bonded warehouse in Mechelen, Belgium, to handle its spare-parts distribution operations serving Europe, Africa and the Middle East, it was faced with a dilemma.

In order to operate such a warehouse efficiently within the European Economic Community (EEC), a highly sophisticated on-line comput-

er system would be needed which could maintain accurate records of the arrival and shipment of 14,000 different types and sizes of parts to and from various nations both within and outside the EEC, thereby maximizing the duty reduction benefits stemming from bonded warehouse status.

Other requirements of the system included automatic currency conversion and the ability to invoice in five different currencies, a system for tracking import licenses and letters of credit, the ability to generate in-

voices in real-time and a general ledger system that could, among other things, report in both dollars and local currencies. A wide variety of other capabilities were also needed, related to basic distribution management functions such as inventory control, order fulfillment, sales analysis, planning and forecasting.

Extensive research had revealed that no such system existed, and the company had neither the resources nor the time to create such a system itself.

A specific company task force had spent two years establishing specifications for the system. That group then spent almost a year evaluating existing packaged distribution application software in both the U.S. and Europe without finding a system that even came close to what was needed.

In-House Study

Simultaneously, another group at Cummins had conducted an in-house study of the possibility of converting the batch system used to handle the company's domestic engine and parts distribution operations to an on-line, internationally oriented distribution management system.

According to Paul J. Linner, Cummins' manager of system development, "The numbers associated with converting our domestic system to international real-time operation, both in terms of man-hours and dollars, were staggering. In addition, due to other more pressing corporate projects, we did not have the available resources in-house to complete this task in time for the planned start-up date of our European distribution/warehouse center.

"We might have had to postpone or even cancel our plans if the data processing manager of one of our subsidiary companies hadn't recalled hearing about a 'turnkey' on-line software/hardware distribution system developed by a Lexington, Mass., company, Distribution Management Systems, Inc. [DMS].

"Although DMS' software/hardware system didn't have all the international 'bells and whistles' we were looking for, it did have an on-line distribution management capability with many of the basic features we were seeking," he said.

Therefore, in late 1978 a contract was signed with DMS for two of its DMS-1000 software/hardware systems and the Digital Equipment Corp. PDP-11 minicomputer the systems run on. The first system was installed in three stages at the warehouse in Belgium beginning early in 1979. A second system was delivered to Cummins' Columbus headquarters for software support and system testing, Linner recalled.

At that point, Linner moved to Belgium for one year to coordinate the various software implementation phases, to establish procedures and to train the Belgian personnel that would be operating the system. Meanwhile, the DMS systems and software staff worked closely with Cummins' systems people in Columbus to create the additional application and system software that would give the basic DMS system the new functions required in the specialized EEC bonded warehouse environment.

As a result of the joint effort, Cummins' bonded warehouse/distribution center in Mechelen went into full operation early in 1980 and has been functioning successfully ever since, Linner added.

According to R. Kent Petersmeyer, (Continued on SR/46)

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Firm Tracks Parts With Distribution System

(Continued from SR/45)

Cummins' director of international parts business, the benefits to the company of a computer-based bonded warehouse operation with the EEC have been "considerable."

As he explained, the 14,000 different parts and components stocked at Mechelen fall within 27 EEC tariff classes with duty rates ranging from 6% to 16%. Some 60% of these parts are produced by Cummins' plants in the UK, which is a member of the EEC.

Therefore, those parts can be shipped to the Belgian warehouse free of duty, no matter where they

are ultimately delivered. However, 40% of the parts stored there are produced in the U.S. These U.S.-made parts would normally be tariffed at the time of their entry into Belgium, regardless of their ultimate destination, Petersmeyer explained.

By operating a bonded warehouse and providing the Belgian customs authorities with detailed computer-prepared reports on the arrival and shipment of all parts that pass through the warehouse, Cummins is able to avoid paying duties on U.S.-made parts when they arrive in Belgium, as other U.S. and non-EEC companies must do.

The company therefore only pays duty on those U.S.-made parts that are delivered within the EEC and only at the time those parts leave the warehouse. In addition, Cummins never has to pay duties on U.S.-made parts transshipped to Africa or the Near East.

"Considering that we moved some \$30 million in parts through that warehouse last year and expect to increase that volume throughout the remainder of the century, it's not difficult to understand that operating the warehouse in a bonded manner contributes greatly to both the cash flow and profitability of our interna-

tional parts-distribution operations," Petersmeyer observed.

"However, without our internationally oriented on-line distribution management system, we would never be able to track the flow of parts and produce the detailed reports necessary to achieving those financial benefits, nor would we have been able to achieve many of the other operational efficiencies that have contributed so much to the success of that Belgian warehouse/distribution center," he added.

Package Handles Firm's Contracts

(Continued from SR/41)

eral accounting, labor and cost system applications. The Prime also is used as a base for eight word processing stations.

"I helped evaluate 20 systems before Alberici decided on the Track 50 product," Novacek said. "It was exactly what we needed. Others were 'too canned' or 'not canned enough'; one did not allow any room for change, the other required too much work and DP skill to operate."

Alberici customized and assured flexibility by adding Info, a relational data base management system developed by Henco Software, Inc. of Waltham, Mass.

The integration of Info and Track 50, both running under Primos, Prime's multitask operating system, allows Alberici to tailor its presentation of information to individual requirements.

Alberici Vice-President Bill Pemberton, in charge of the company's Building Division, said, "This system really helps my project managers get a handle on current status and problems and, more importantly, on projected problems. The reports they look at now provide meaningful, concise, organized information that summarizes and provides an excellent picture of 'what is' and based on that 'what is,' what might be, whether good or bad. Now, managers can actually 'control' the successfulness of a project."

"Manual charts were often outdated before they were complete, and some systems' graphics were so complicated to use that they were untimely," Novacek explained. "With Track 50's graphics module and Info/Prime's power and ease of use, our charts are accurate, immediate and clear. Areas needing special attention are clearly identified; information is consolidated into small, easy-to-handle, reproducible charts."

Track 50 on Prime is designed for interactive batch operation. It will prompt users in three degrees of detail to accommodate different proficiency levels.

"There is actually some psychology to our report customization," Novacek said. "There are people who get a little nervous working with computer reports. The more manual and friendly the report, the more successful it is."

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When Choosing a System

Posing Questions Helps to Define Your Needs

By Curtis R. Beckman
Special to CW†

Use a question-and-answer process to formulate your choice of application software and involve everyone concerned with the project in the decision. That is the approach the Housing Authority of Oakland, Calif., took recently when we purchased an application package.

The original question we asked was: Could we substantially improve the capability of our present DP system and save money in the process?

This question led to more specific requirements: greater response from the system in accomplishing hour-by-hour work, more up-to-date information on authority functions, accessibility of information by all departments, speedy retrieval and reduction of direct data processing expenditures.

Implementation Steps

The next phase was to develop implementation steps. These included system requirements and operating characteristics, plus a request for proposal (RFP) for an evaluation methodology.

Responsibilities were delegated to the DP department under the supervision of the authority's DP Steering Committee. The authority's Board of Commissioners approved the plan conceptually before the development and reviewed and approved each phase after completion. A consulting certified public accountant firm assisted in evaluation, and the city attorney's office performed legal reviews.

The data processing staff proceeded by drafting present and future system scenarios for each major operating unit of the authority. The present scenario served as a description of the point of departure and as a measure of progress. The future scenario described new methods of operating in accordance with the overall objectives — but without any cost or technological constraints.

Next came discussions of the plan with responsible managers. Suggested refinements were incorporated and the system's relationship defined. Finally, the consolidated drafts with the summary of current data processing costs were presented to the authority's DP Steering Committee for consideration.

Three Decisions

Three decisions resulted from the review. The first was to make the transition process the basis for the RFP. The key was to request proposals based on how to make the transition rather than for specific equipment.

The second decision was that a maximum constraint on spending was also needed. We agreed that five years was a reasonable system life cycle and that we should constrain spending to the same amount as the projected spending assumed for the present system.

The last decision was to recommend that the Board of Commission-

ers approve further development of the project. Following the board's approval, the authority began incorporating the system scenario in an RFP and developing the evaluation methodology. The committee used the information already collected on the existing system and added bid instructions to write the RFP document.

Assign Weights to Criteria

It's important to evaluate the proposal objectively. We assigned weights to the criteria according to

our needs. Our needs were primary applications, 20; conversion, 5; management and training, 5; other applications and support, 5; costs, 25; maintenance, 10; and contractual relations, 10. The remaining 20 points were for hardware.

Using this list, the DP staff and our management consultants identified subcategories to be used in evaluating vendors' responsiveness. Related questions were developed and subtotals of weights were allocated to each category.

Related questions involved poten-

tial expansion possibilities, vendor training and support, maintenance agreements, references, financial standing and qualifications of systems designers, analysts and programmers. It is vitally important to investigate thoroughly the potential vendor.

Next, we devised a proposal evaluation work sheet that provided space for entry of answers obtained from each submitted proposal. This list was included in the RFP for the benefit of the vendor.

(Continued on SR148)

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Insurance Firm's Investment in System Pays Off

LONG GROVE, Ill. — Sometimes a company has to spend money to save money.

By making the investment in Policy Management Systems Corp.'s Policy Management System (PMS) package to automate commercial automobile and workers' compensation, the Kemper Group, headquartered here, feels it will save at least \$2 million gross in operating expenses the first year. But even with 33 branch and eight division offices handling commercial auto and workers' compensation, Kemper is just beginning a long-range plan. When PMS Version VII is implemented,

automating commercial property lines, Kemper estimates that savings will triple to \$6 million per year.

For the 13th largest property and casualty insurance company in the U.S., writing \$800 million in annual commercial lines premium, commercial automation was a massive effort. But Kemper's installation was completed in 16 months.

Honest Approach

"We took an honest approach in introducing PMS," Dale Johnston, manager of Kemper's PMS installation, said. "If we had tried to sell automation as 'pushing a button and

watching the system do the work,' we would have been asking for attitude problems. Instead, we took a low-key approach and plainly told our users that Kemper needs automation to stay competitive over the long-run."

Al Clement, division operations officer at Kemper's New England Division, added, "We spent a good deal of time telling our division users what PMS was, and more important, what PMS was not."

The surprise was that the Kemper people were not only ready for automation, but were excited about it as well. In Johnston's view, the change

in attitude over the years is remarkable. "Kemper has had automation in some form since the '50s. When we implemented our earliest systems, we had predictable staff turnovers in some offices. People did not give automation a chance. But today, users are surpassing our expectations in accepting the challenge to make automation successful."

Although accepting automation seemed inherent in Kemper's field force, management nurtured the attitude with deliberate care. For pride of authorship, Kemper named its PMS production system Polaris, which stands for Policy Automated Rating and Issuance System. Users think of it as Kemper's system with programs provided by Policy Management Systems. But beyond encouraging the attitude, Kemper thoroughly trained employees to use PMS.

A six-member team at the Kemper home office was responsible for creating the training materials for the installation offices. After attending classes sponsored by Policy Management Systems, the team worked full-time for over a year to develop and implement Kemper's training materials. Two videotaped presentations to introduce the system, an intensive two-week training course and a comprehensive operator's guide were among the training materials.

(Continued on SR/50)

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Posing Questions Defines Needs

(Continued from SR/47)

As time progressed, we needed to divide further the phases, such as initial screening of proposals, selecting two proposal finalists and further evaluation of the finalists. After the initial screening, the committee reviewed each proposal, answered the questions and compiled the answers on the proposal evaluation work sheet.

The final stages involved scoring each subcategory individually by members of the DP staff, averaging the scores and multiplying by the weight assigned to each subcategory. The sum of all the extended scores ranked the proposals in order of responsiveness to the qualitative requirements of the authority.

For the last step, we evaluated cost by developing five-year cost projections and comparing them with the projected five-year costs, assuming the status quo. The two highest scoring proposals became the finalists.

The two finalists made a one-day capabilities presentation/demonstration and answered specific issue questions. These finalists were then rescored using the same methodology, and the new average pointed to the most responsive finalist. If quality had not matched costs, we would have computed cost per qualitative point, with the lowest cost per point being the highest rated proposal.

Beckman is manager of data processing at the Housing Authority of Oakland, Calif.

Handles Membership Services

Educators Group Chalks Up Growth to System

BURLINGAME, Calif. — A software package designed specifically for nonprofit institutions is enabling 14,000 California educators to make their voices heard in an effective and organized fashion.

The Association of California School Administrators (Acsa) is a group of educators who have joined together to support mutual career goals and interests. Special projects organized from Acsa's Burlingame headquarters here include a continuing education program, a publication-distribution clearinghouse and political activities to encourage high standards for the more than four million California students.

Formed in the late 1970s, Acsa has grown rapidly. It now comprises 18 regional districts with many local chapters in each region. Originally, a computer service bureau handled Acsa's membership mailing and administration. But the service bureau's batch-oriented environment required extensive paperwork and limited Acsa's membership service flexibility.

Accounting Problems

Preparing mailing lists and tracking membership dues were only a few of Acsa's membership accounting problems. According to Robert E. Lowe, Acsa director of management information services, "Delays of up to a full week for simple mailing lists were not uncommon. Greater limitations of our accounting system restricted our ability to provide other services requested by our members."

To cope with the delays, Acsa recently purchased a Wang Laboratories, Inc. VS80 system and the Software for Nonprofit Association Processing (Snap) system developed by Data Direction of Oakland, Calif.

Nonprofit organizations obtain operating expenses by collecting fees for products and services. But unique accounting problems are created by multiple membership rates, optional benefits and different payment schedules.

For example, six different Acsa membership fee structures exist for a variety of categories. Each membership category receives different publications and privileges and may pay for the optional services by different methods. Snap is an "open item" accounts receivable, accounts payable and general ledger system that allows Acsa members to select from a mix of billing methods.

"A school administrator can pay his membership fee via payroll deduction and pay cash for his family life or group life insurance," Lowe explained. "Our members really enjoy this unique convenience."

Other services include insurance options, a credit union, legal assistance and discounts for popular products and activities, Lowe said. Snap can track as many as 10 separate billing items.

Data base capabilities included with Snap allow up to 30 unique characteristics for each Acsa member

to be logged and identified, a spokesman said. Acsa tracks member backgrounds, size and types of schools, job classifications, years on staff, publications received, professional seminars attended and other interests, such as a talent for political lobbying. These characteristics can be analyzed as part of a geographic, regional, district or chapter profile.

"We can prepare almost any selective search of our membership data base that we want," Lowe said.

Acsa also uses Snap to coordinate distribution of its weekly newspaper

EdCal, monthly magazine Thrust, a catalog of resource information and other special bulletins. "Address changes used to take one month with the service bureau," Lowe said. "With Snap, morning address changes are applied to the afternoon mail."

Consolidating Monthly Reports

Monthly reports have also been consolidated, Lowe said. Careful analysis of membership needs reduced the number of regularly generated reports from more than 50 to

five. "Snap lets us make special reports on an 'as needed' basis instead of by default," Lowe said.

Acsa also uses the Snap Conference Subsystem to maintain accurate registration and reservations for conferences and workshops. For a typical event, Acsa may have 400 members attending 10 different workshops with a capacity of 40 per class, Lowe said. Snap ensures that all classes are filled equitably on a first-come, first-served basis. Lowe said the association also recognizes

(Continued on SR150)

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Educators Chalk Up Improvements to System

(Continued from SR/49)

significant cost savings from having precise hotel and restaurant reservations. "It gets expensive to have the caterer prepare 50 dinners at \$7.50 apiece and then have only 30 show,"

he said.

Using Snap's planning and post-event tracking capability, Acsa has recently implemented an in-house mini university in which members earn college credit for administrative

classes.

Participating members reach simple milestones as they progress through the training program, and Acsa follows up on class attendance with on-site visits to school districts.

Acsa also takes positions on issues affecting public education. In last November's state elections, the organization supported a proposed \$500 million bond issue to provide capital outlay for construction or improvement of public schools and opposed a proposed constitutional amendment that created a textbook loan program for private school students. By informing and motivating its 14,000-plus membership, Acsa takes some credit for successfully prevailing on both issues.

According to Lowe, successful campaigns on these two issues alone has justified the entire cost of Snap.

Wangnet communications software now connects Acsa's Sacramento, Calif., lobbying staff with the Burlingame headquarters. Immediate news on legislative actions is transferred over this link for use in weekly publications.

Firm's Investment in System Pays Off

(Continued from SR/48)

In groups of 12, two or three people from every branch office took the course to learn how to use PMS. A PMS test system was rigged so that the master file would present policies for renewal, audit transactions and other activities during the course of the class. In two weeks, the users learned to operate PMS with respect to new business, renewals, changes, audit transactions, inquiry transactions — every business transaction that is likely to occur in day-to-day operations.

Kemper's system is very close to the PMS base system. The modifications and interfaces with Kemper-produced systems were kept to a minimum. But even so, before crossing the nation to implement the system, Kemper had to secure program code for each branch office. For nine months the system was tested for every state behind the scenes. As each division office was installed, testing was concentrated for the office's pri-

mary states.

The first Kemper office to install PMS was the Summit, N.J., branch in the Mid-Atlantic Division. Lou Vozza, division operations officer, wanted to be first for two reasons: "We needed to cut expenses and we saw PMS as the way to do it. I see automation as the way of the future and I just wanted to get into it early."

After Kemper's home office assisted with the first installation, the divisions implemented their other offices.

Value to Underwriting

Paul Clark, Empire Division operations officer, and Nick Tkachuk, Central Division operations officer, commented on the system's value to underwriting. "Before we implemented, I was worried about underwriters adjusting to the system," Clark said. "I started with an extreme and told underwriters not to pull any files. They've learned to rely on PMS and only pull files when it is abso-

lutely necessary."

Tkachuk continued: "The on-line quote capability has been a tremendous help in underwriting. The casualty underwriters are using the system with such success that the property underwriters are anxious to get a taste of PMS with Version VII."

Johnston commented that the training was costly and the implementation plan meticulous, but as a result, each office began processing on a new and renewal basis on the first day it had the system installed.

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Problems That Confound Personnel Data Bases

By Richard W. Iverson

Special to CW†

Applications packages that create an information data base with many users can deteriorate in the eyes of the users without the management information systems (MIS) staff knowing about it. The data base that most easily annoys its users is, probably, the human resource data base — a mixture of personnel, payroll and

benefits information. The functions can change quickly, and the users tend to vary in sophistication.

We can assume that there is a group responsible for human resource systems, a human resource information center, which usually is located in personnel. Along with each standard is a description both of symptoms that indicate a problem is present and of specific audit steps

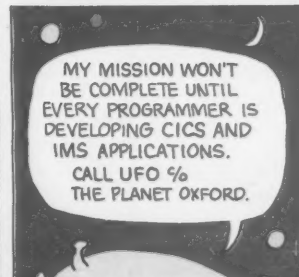
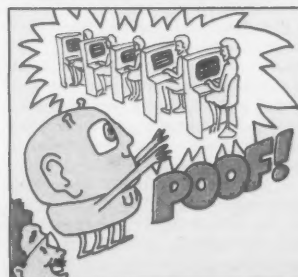
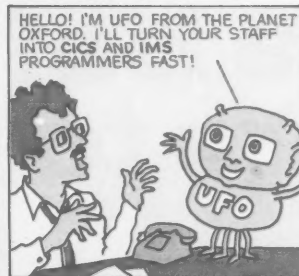
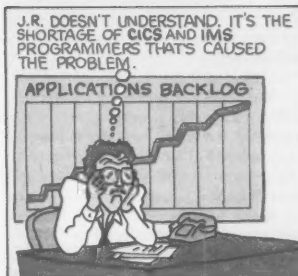
that can be taken to examine the problem.

There are two types of error: data that was wrong when it was entered and data that became wrong because it was not updated.

Though most systems have edit criteria to screen incoming data, errors do slip past the edit routines because wrong data can be legitimate. These errors can be caught by tight-

ening the feedback loop. If the person who submitted the data could see what it looks like after being processed by the computer, most mistakes could be detected quickly. The principal means for doing this is a turnaround document such as an employee profile.

The error that results from out-of-date information can best be treated
(Continued on SR/52)



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Keep Careful Watch Over Personnel Data Bases

(Continued from SR/51)

by examining where the delay occurs. Sometimes the manager neglects to send in a profile or other change document. This can be corrected by training, communications, documentation or a procedural change that ties the submission of profiles to what the manager wants, such as a salary increase for the employee.

The scope of information in the data base needs to be reviewed at least annually: Do the people who use the system have the information they need to do their jobs? If not, how feasible is it for the system to

supply the necessary data?

Symptoms of a problem with data base accuracy and completeness include:

- Incorrect data on reports.
- Mismatched information when personnel data is compared with other data.
- People continuing to maintain old records.

Audit steps you can use are:

- Review audit trails for number of errors and determine how quickly the errors are corrected.
- Run searches for missing data.
- Determine feedback process.

Does it cover all of the data? Is it regularly applied?

ularly applied?

• Interview the functional managers in personnel to see how they want to use the system and why they may not be using it that way anymore.

• Interview senior management to determine how their needs can be better met.

Before the advent of human resource systems, periodic reports were part of the routine drudgery of the personnel department. Personnel staff kept its fingers crossed that head-count figures would not be too different from those produced by payroll or other departments.

Symptoms of a problem with standard reports include:

- No one complains if the reports are missed one week.
- Complaints from senior management that they did not know what was going on despite having been told about it on a report.
- Piles of paper in the center for human resource information.

Audit steps you can use are:

- Review a list of all standard reports, their control frequency and distribution. Do people know why they are used?

• Determine whether a newly hired person receiving periodic reports gets an explanation of them.

The ability to extract information easily from the human resource data base may not be widely known within an organization. Evidence of this is the uneven distribution of report requests. Most organizations do not use data effectively.

Symptoms of a problem with ad hoc reporting include:

- Only people in the data processing department write reports because the report writer is so complicated.

• Not many reports are requested each month.

Audit steps you can use are:

- Review the number of ad hoc requests run each month and determine the source. Are they mostly from within human resource? Do other parts of the organization request reports?

• Determine the nature of the requests. Are there business problems in the organization that could be better handled with information from the data base?

Personnel staff have different degrees of involvement with the system. Those directly responsible must have some understanding of how the system works technically. These people should be able to make the revisions needed to meet "impossible" requests.

Symptoms of a problem with staff knowledge include:

- Complaints about lack of service from the human resource information center.

• Documentation on system was supplied by the vendor, but never modified.

Audit steps you can use are:

- Determine whether the human resource information center staff knows how to interpret reports produced by the system.

• Ask whether searches are logged. Are costs of operating the system known? Are error rates satisfactory? Is there any formal training for a new person?

There are two kinds of policies involved with a system. One set governs the operation of the system itself and the other is made up of normal personnel policies that are implemented with the aid of the system.

Whether a system is administered effectively is partly a function of the clarity of the policies, procedures and documentation. But in many organizations, the question is one of

(Continued on SR/54)

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Software Fits System/38 Finance Package Shoulders Firm's Accounts

BERKELEY, Calif. — Finding the right software package becomes even more of a challenge when there are few offerings for your particular hardware configuration.

Jeff Kohr, controller at The North Face here, found that although the IBM System/38 has been available since 1980, very few comprehensive software systems had been developed to meet the unique design concepts of this system. The North Face, which manufactures and markets outdoor equipment such as tents, backpacks and clothing, leased a System/38 in March of 1981.

"Most of the four or five software packages we found either did not take full advantage of the System/38's data base capabilities, had been converted from other systems or were not written in RPG-III. We chose Lawson Associates, Inc.'s General Accounting software because all of the programs met our accounting needs and were developed for the System/38," Kohr said. Lawson Associates is a Minneapolis-based software company.

"We looked at many companies that were trying to sell software that was not finished. If you have an immediate installation deadline and the software is not completed, it can throw off your entire schedule," Kohr said. "Ken Holec, from Lawson, was able to demonstrate its software, and we had a chance to see how it worked."

Kohr feels that Lawson's accounting software embodies the company's philosophy — providing good, basic, easy-to-modify software that does not contain a lot of extras that most companies do not need and probably never will. "It is good, user-oriented, well-documented software that works," he added. Initially, Kohr was concerned that distance would pose a problem during the installation and implementation of the software.

Kohr is pleased with the support from Lawson. "Most problems are handled over the phone," he explained, "and on-site installation and training are included in the package price. We have had someone from Lawson here twice since we installed the software to install modifications and iron out some problems. Distance has been no problem at all," he maintained.

"No packaged software is perfect," Kohr explained, "and I would be wary of any vendor that said its software was completely 'debugged.' The System/38 is still relatively new, and its capabilities are just being explored. Minor bugs are a fact of life, but a good vendor should be able to correct bugs quickly and efficiently. Lawson has been very accessible in terms of correcting any problems that have developed. That accessibility helped tremendously in the system implementation."

Kohr felt the most effective way for The North Face to use the System/38 was to install packaged software for the accounting functions. Purchasing packaged software

would allow the company's in-house DP staff to concentrate on developing and refining the company's manufacturing and distribution systems.

"With North Face's internal resources and Lawson's capabilities, we felt that it was best to purchase packaged accounting software so that our staff was not working simultaneously on two independent systems. We didn't feel that either system could be delayed," Kohr said.

In early February of 1982, The North Face began working with Lawson. By the end of the month,

Lawson had installed complete Accounts Payable and General Ledger systems. Lawson's Fixed Assets system is being installed and its Payroll system was installed last June.

"Everything went smoothly during the installation process. In fact, we asked Lawson to convert our General Ledger and Accounts Payable master files prior to installation," Kohr said. "With our limited internal resources, we felt that it was the best use of both our time and the software to have the company that developed the programs convert the

data that would ultimately be used in the system."

One of North Face's most important needs was immediate delivery. In January of 1982, North Face experienced a common, potentially disastrous problem with its computer — the disk drive failed and some data was lost.

"We were more than two months behind in our accounts payable and needed to get caught up quickly. With Lawson's help, we closed five months of accounting periods in 2½ (Continued on SR/55)

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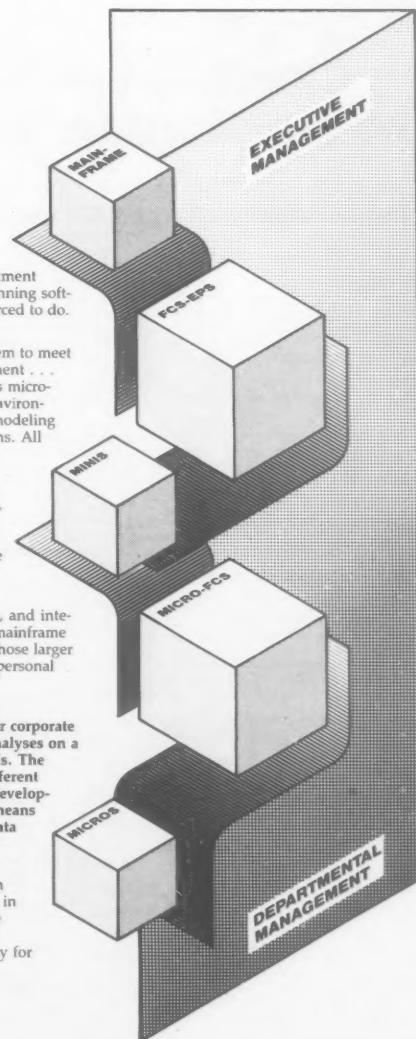
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Personnel Data Bases Need Careful Planning

(Continued from SR/52)

their presence or absence rather than their clarity.

Symptoms of a problem with policies, procedures and documentation include:

- Everything falls apart when the system developer leaves.
- Inconsistent application of policies because the procedures are not spelled out or are not changed when new circumstances arise.

Audit steps you can use are:

- Ask someone in the human resource information center a question that requires reading the documentation.

- Determine when the documentation was last updated and who is responsible for changing it.

Forms and reports are still integral parts of the flow of necessary information. The customary means for providing data about an individual is the profile — a preprinted form that displays relevant information and is used as a turnaround document.

How smoothly the updating process works depends on the manager's desire to complete the form, his understanding of how to complete it and the difficulty of entering approvals for the form's data into the system.

Symptoms of a problem with paper flow and consolidation of forms include:

- Complaints about out-of-date information.
- Reports are late, illegible, voluminous and unread.
- The forms are too difficult to enter into the system directly.

Audit steps you can use are:

- Collect copies of all forms used with the system. Are forms that receive wide distribution well designed and easy to read? How many forms could be eliminated with modification to a profile, procedure or report?

- Trace the flow of key forms. Are forms handled in a timely fashion? Do delays degrade the information in the data base?

Efficiency is the total amount of machine resource and people resources, including the time of the users required to produce the desired result.

When modern on-line data base systems run into problems of excessive waiting, the on-line input and/or the on-line data retrieval can be unhooked from the data base. The input may still be entered on-line, but would be held for batch update. Retrieval could also be on-line, only against an extract of the data base rather than the data base itself.

Working with day-old data is not a problem for most personnel and payroll departments. Some software packages make this "unhooking" easy, while others require extensive programming.

Symptoms of a problem in technical operations include:

- Chargebacks are eating up more of the budget.
- Users are frustrated over slow response time.

Audit steps you can use are:

- Review costs of operating the system.
- Compare the trend of costs of systems with volumes of input, retrieval and other transactions.

- Analyze size of master files and table files and determine what, if anything, can be purged. Can systems be made more efficient by handling parts in a batch mode?

Most of the flack around a human resource system results from friction between the human resource information center and any of three groups with which it interacts: data processing, personnel and line units.

The human resource information center and the data processing department lean on each other. The human resource information center is dependent on DP for technical understanding and operational support. DP is dependent on the information center, as it is on users in general, to justify its existence.

Symptoms of organizational problems include these remarks:

- "They make everything a hassle."
- "Basically, they're arrogant."
- "They take forever to do anything."

Audit steps you can use are:

- Ask if anyone involved with the system has said this and about whom.
- Interview the system's key users to determine how helpful and knowledgeable the human resource information center staff is. Ask human resource center staff what its users are like.

In summary, only periodic audits that apply generally accepted standards can assure that a data base continues to provide maximum benefits to the organization.

Iverson is president of Iverson Group, Inc., a New York-based human resource system consulting firm. He was co-founder of Insci, which specializes in human resource applications.

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Food Firm Find Handles Shipping Rates

ENGLEWOOD CLIFFS, N.J. — The reorganization of its transportation system by product orientation led to the need for two rate-handling software packages for CPC International, Inc. here.

CPC International is a corporation with 31 manufacturing plants in North America that handle its two major business segments: branded grocery products and corn wet milling.

The transportation department has been actively involved in the establishment of computerized systems to reduce and control the transportation costs since the early '60s, John J. Clement, the firm's director of transportation explained.

In 1964, a Transportation Information Program system was implemented to control the utilization of a fleet of more than 4,000 railroad cars through a trip forecast time, along with a semiautomated routing program that included mileage allowance accounting.

Since the enactment of the Motor Carrier Act of 1980 and the Staggers Rail Act of 1980, freight rates have lost much of their predictability and stability from the standpoint of anticipated lead time before change. This has created a sense of immediacy for shippers and a need to catalog, look up and update rates on a very short notice, plus the ability to immediately communicate the changes to users.

"We realized quite early that the new re-regulated transportation world was going to mean a new transportation organizational approach. We would have to structure for greater flexibility for price negotiation," he said.

Package Found For System/38

(Continued from SR/53)
months using multiple entries," he said.

"All the systems were completely documented and ready for installation. Cost justification was no problem. We have been able to handle a larger volume more quickly without adding to our staff in any way. The software has good audit trails, which should make our audit firm happy," Kohr said.

The North Face has one of the largest System/38 installations on the West Coast and the system is used almost 24 hours-a-day, Kohr said.

Because of its extensive use of the system, Kohr feels that North Face has pushed the system to its limits and has been generally satisfied with the results.

"The System/38 is basically a good, sound machine. I like the concept and the way it operates. We may have had more problems than most companies because we use the system so much. I think IBM solved a lot of problems when it brought out Release 3, and we are looking forward to upgrading to the Model 7," he said.

"We have to be able to react immediately to take advantage of potential cost-savings opportunities.

"There is no doubt that reorganizing our transportation department by product orientation is the most effective way for CPC to now deal with its carriers and to obtain the least costly transportation prices," Clement said.

In 1971, CPC installed a semi-automated rail tariff rate-maintenance system (only for corn products) with the cooperation of an outside-rate maintenance firm. "Under the regulated rate environment in the 1970s, this inside/outside co-

operative service approach worked very well. Today, with deregulation creating an atmosphere whereby negotiation of rates is between the shipper and the specific individual carrier, we must arrive at and distribute current rate information within hours, not days or weeks," he said.

By 1980, corn products was on-line with a newly developed internal Business Administration Order-Entry System using on-line CRT terminals tied into a major Honeywell, Inc. Executive central processor.

Next the firm looked toward automatically integrating a computerized rail and motor-rate data base into this

new on-line system.

In October of 1981, CPC contracted with Transportation Concepts and Services of Metuchen, N.J., to install its Compu-Rate II and Compu-Rate IV software packages and began on-site implementation and training.

Compu-Rate II creates, maintains and distributes large volumes of rate data; Compu-Rate IV, when provided with CPC's internally generated shipment data, retrieves, applicable rates from the rate files of Compu-Rate II and calculates the lowest applicable freight charges for application to bills of lading and/or sales invoice records, he said.

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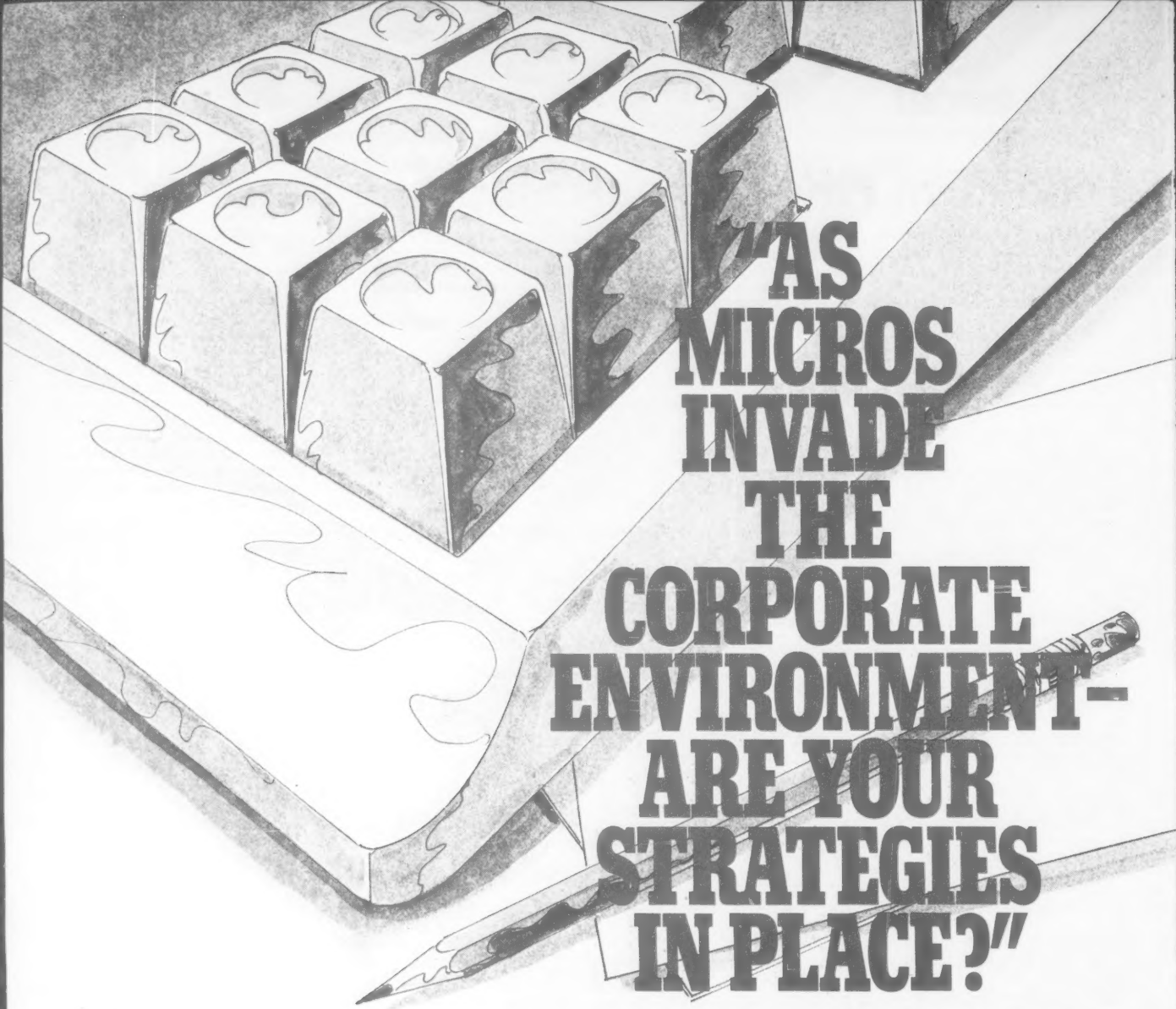
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In addition to the tutorials and applications stories on integrating micros, you'll read a round-up story on the top ten microcomputer manufacturers, a key story on what kinds of

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If you use, plan to use or need micros in your organization, you must not miss this March 28 Special Report in *Computerworld*. This one issue will give you the answers you need to serve your users.

And if you market microcomputers or microcomputer products — here's where you'll find your customers. Among the thousands of readers of *Computerworld* who are vitally involved in micro purchasing decisions. Your ad in this issue will insure them more complete information on the products in the field. Ad close for this Micros in Big Business Special Report is March 11.

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For Scientific Programs SEL Introduces Line of 32-Bit Minis

By Ed Scannell
CW Staff

FORT LAUDERDALE, Fla. — Gould, Inc.'s SEL Computer Systems Division took the wraps off a series of middle-range 32-bit minicomputers that, according to Whetstone benchmarks, run scientific programs an average of 50% faster than similarly configured Digital Equipment Corp. VAX 11/780 and 11/782 systems.

Software-compatible with the company's low-end 32/27 line and high-end 32/87 series, the 32/67 family consists of the 32/6705 and 32/6750, which both process 1.7 million Whetstone 1 instruction/sec, and the 32/6780 that performs 3 million Whetstone 1 instruction/sec. This compares with the 11/780 and 11/782 Whetstone ratings of 1.2 and 2.0, respectively.

The three systems, which run under SEL's recently released version of the Unix operating system, cost between \$120,500 and \$170,000, depending on the configuration chosen. All three systems will be available in June, the company said.

Besides the three 32-bit systems, SEL also announced it is forming a new marketing group called Distributed Systems. The group will sell products primarily to the engineering and scientific markets that will complement the company's existing product lines. The first products will be brought to market before the end of this year, a spokesman for the company said.

Unlike most producers of minicomputer systems, SEL attributes the processing speed of its new systems to hardware, not software. While enhancements made to Unix and SEL-developed MPX operating systems contributed to the three systems'



The Gould 32/67

Whetstone ratings, the company claimed that innovative hardware is largely responsible for those scores.

One of the hardware components the vendor said is an industry first is the 32K-

byte dual cache memory that has separate 16K-byte banks for data and instructions. Dave Lowry, product manager of the 32/67 family, said it is this type of cache orga-

(Continued on Page 56)

HP 3000 Users Get Disk Drive

WESTLAKE VILLAGE, Calif. — A disk drive system offering increased storage and performance as well as proprietary cache options for Hewlett-Packard Co.'s Series 3000 Models 30, 33, 40, 44, 60 and 64 computers has been introduced here by Qualex Technology, Inc.

The Series 4000 is available with either 410 or 820M bytes of formatted data on a 10½-in. Winchester-type fixed disk drive, the vendor explained. It is packaged in a single cabinet that can house two drives. Qualex's cache options include a choice of four internal storage configurations, providing hit-rates of 80% to 90% on most frequently accessed data, the vendor claimed.

Pricing on this series starts at \$25,000 for the initial 410M-byte configuration, with add-on drives priced from \$22,650. Further details may be obtained from Qualex at Suite 110, 31220 LaBaya Drive, Westlake Village, Calif. 91362.

Why Introduce 8-Bit Business Systems?

In the past few weeks, two major microcomputer manufacturers — Tandy Corp. and Altos Computer Systems, Inc. — have released systems that appear to violate what is fast becoming the business sys-

tem of entry-level applications in the business marketplace.

"There is a lot of 8-bit software avail-

(Continued on Page 58)

Analysis

tems rule: They are based on 8-bit, rather than 16-bit microprocessors. However, there is a method to their architectural madness.

While both firms are marking time until there is ample software for their 16-bit systems, they hope to use the new 8-bit entries to cash in on the increasing num-

Micro Incorporates Intel Coprocessors

PALO ALTO, Calif. — Information Solutions, Inc. has announced the Model 430 IPS, a microcomputer that incorporates Intel Corp. 8086, 8088 and 8089 coprocessors.

The unit is available with 128K bytes of random-access memory (RAM), which is expandable to 512K bytes. The system also features a detached keyboard with an IBM Selectric layout, cursor control, 10-key speed pad and up to six RS-232C serial channels for local terminals, printers and

modems, the vendor said.

The unit supports up to four 5¼-in. Winchester disk drives and two double-sided dual-density floppy disk drives, the vendor said.

A basic Model 430 IPS uses Digital Research, Inc.'s MP/M operating system and costs \$10,000 and up, the vendor said from 2205B Fortune Drive, San Jose, Calif. 95131.

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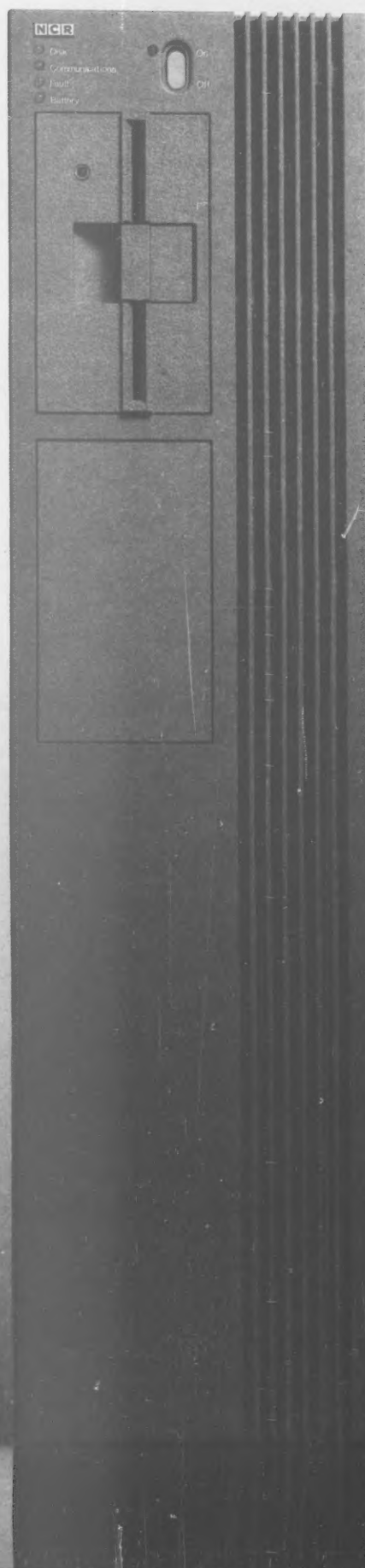
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PC WORLD Day March 19 Program of Events:

Located in the Ballroom of the San Franciscan Hotel, one block from Brooks Hall, San Francisco.

9:30-10:30 a.m. "Systems Software for the PC"

Panel members: Gary Kildall, President, Digital Research; Chris Larson, Director of Marketing, Microsoft; David Hughes, Independent Consultant; Syd Geraghty, President, Quantum Software; C.A. Irvine, Vice President of Engineering, SofTech Systems; Kearney Rietmann, Associate Editor, PC World.

11:00-12:00 p.m. "The PC Phenomenon"

Panel members: David Bunnell, President and Publisher, PC World; Cheryl Woodward, Associate Publisher, PC World; Ron Posner, Chairman, National Training Systems; Portia Isaacson, President, Future Computing; Martin Alpert, President, Tecmar.

12:30-2:00 p.m. "Second Generation Software"

Panel members: Mitchell Kapor, President, Lotus Development Corp.; Jeff Harbers, Associate Manager, End-User Division, Microsoft; Gilbert Hoxie, President, Context Management Corp.; Roy Folk, Division Marketing Manager, VisiCorp; Harry Miller, Associate Editor, PC World.

2:30-4:00 p.m. "PC Multiprocessing, Networking, and Communications"

Panel members: Drew Major, Software Systems Manager, Novell Data Systems; Steve Pomeroy, Product Marketing Manager, 3COM; Steven Cook, Technical Editor, PC World; Phil Belanger, Omni Project Manager, Corvus.

4:30-6:00 p.m. "PC Add-Ons—What Is Compatibility?"

Panel members: Rod Canion, President, COMPAQ Computer Corp.; Andrew Fluegelman, Editor, PC World; Dr. Robert Harp, Chairman of the Board, Corona Data Systems; Karl Koessel, Programming Editor, PC World; Steven Cook, Technical Editor, PC World; Martin Alpert, President, Tecmar.

The West Coast Computer Faire Is March 18, 19, 20

For pre-registration at a discount for 10 or more call Computer Faire (415) 851-7077. Registration at the door for 3 days including conference program and show is \$15.

Don't Miss PC WORLD Day March 19

Attendance at PC WORLD Day events is free to all participants in the West Coast Computer Faire, but space is limited to the first 500 persons so please come early to ensure you don't miss PC WORLD's presentations.

Also, visit the PC WORLD booth at Brooks Hall. Booth numbers: 1127, 1129, 1131.

3M Adds Rigid Disk Module to Micrapoint II

ST. PAUL, Minn. — 3M Corp.'s File Management Division has added a rigid disk module to its Micrapoint II computer-assisted micrographic retrieval (CAR) system to expand capacity and improve throughput for

users. The module is geared toward users with a volume of 10,000 entries per week.

The module contains a 70M-byte (unformatted) disk said to provide users with a net capacity of 40M

bytes for record storage. Incorporated in the same floor cabinet is a streaming-tape, ¼-in. data cartridge system for backup.

Other features include a "delete and pack" operation to remove portions of entries to free up space, an archive-to-diskette operation to hold data removed from the rigid disk system and the addition of up to five remote terminals and a display printer.

The Micrapoint II with disk module and Essential Model 6000 reader printer cost \$60,000. Software for the system and a program allowing current users to move existing diskette records to the rigid disk are included in the price, the vendor said from 3M, Department FM-83-7, P.O. Box 33600, St. Paul, Minn. 55133.



3M Corp.'s Rigid Disk Module

Interfaces Allow Controllers To Drive Plotter/Printers

ANAHEIM, Calif. — California Computer Products, Inc. has announced three interfaces that allow the firm's plotter controllers to drive electrostatic plotter/printers (EPP) manufactured by Versatec, Inc.

The Versatec EPP interface (Veppi) allows Calcomp Model 951 and 953 vector-to-raster controllers to drive any Versatec 8000 series or V80 plotter/printer as well as one Calcomp plotter, the vendor said.

The Versatec Translator Interface (VTX) enables up to eight Versatec or Calcomp plotter/printers (in any combination) as well as one pen plotter, to be driven by Calcomp 951 or 953 controllers, the vendor said.

The Versatec Plotter Control Logic (VPCL) interface allows a Calcomp

5000 series printer/plotter to look like a Versatec 8000 series or V80 series printer/plotter, the vendor said.

The interfaces cost between \$2,000 and \$4,000, the vendor said from 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Winnies Aimed At Micro Mart

SANTA CLARA, Calif. — Memorex Corp. has announced two compact 5¼-in. fixed/removable media Winchester disk drives.

Called the 400 series, the drives are available in two models: the 410 with 5M bytes of fixed and 5M bytes of removable storage; and the 415, which offers 10M bytes of fixed and 5M bytes of removable storage, the vendor said.

Aimed at the desktop computer market, the drives are designed to provide an 8,000-hour mean time between failure and no routine maintenance is required, according to the vendor.

The 410 is available immediately and costs \$1,400. The 415 will be available in July and costs \$1,595. Both prices are for quantities of 500, the vendor said from San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Epson Introduces Bidirectional Printer

TORRANCE, Calif. — A bidirectional dot-matrix printer that is said to operate at speeds up to 160 char./sec. has been introduced here by Epson America, Inc.

The FX-80 offers a software-selectable choice of elite or pica print spacing, Epson said. Users can also reportedly download special fonts from the host to the printer's memory. It provides 9-dot by 9-dot matrix characters with full descenders and is downward-compatible with the Epson MX series of printers, the vendor said.

This product retails for \$699 and is available immediately, the vendor said from 3415 Kashiwa St., Torrance, Calif. 90505.

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Storage Line Released by 3R

WESTBORO, Mass. — 3R Computers, Inc. has added a family of storage devices to its product line that reportedly combine a diskette with a Winchester disk subsystem.

Called the Avatar TC10 Universal Terminal Converter, the system is intended for intelligent workstation users with large local data base requirements, providing up to 20M bytes of on-line disk storage, the vendor said. The design of this product is said to allow users to operate any Digital Research, Inc. CP/M-based application on any Avatar-supported CRT terminal.

The system includes a Zilog, Inc. Z80A microprocessor, three asynchronous serial ports and a Centron-

ics, Inc.-type parallel printer interface. Prices for this series range from \$1,995 to \$6,095, depending on M-byte capacity from the vendor at 18 Lyman St., Westboro, Mass. 01581.

Billing System Targets Law Firms

TREVOSE, Pa. — Delta Data Systems Corp. has announced a turnkey billing and management system for law offices.

Incorporating the firm's D8000 microcomputer, the Legis legal information system can be used in law offices with between two and 50 members. The system includes Delta Data terminals, between 10M and 40M bytes of Winchester disk storage and

dot matrix and letter-quality printers, the vendor said.

The Delta Data system uses the firm's Turbodos operating system, which is compatible with Digital Research, Inc.'s CP/M operating system, the vendor said. The system costs between \$21,000 and \$25,000, depending on the configuration, the vendor said from 2595 Metropolitan Drive, Trevose, Pa. 19047.

Digitizer Boards Unveiled

QUEBEC CITY — Two video digitizer boards have been introduced by Matrox Electronic Systems Ltd.

The VAF-512 and QVAF-512 (a Digital Equipment Corp. LSI-11-compatible version) are designed to work with Matrox's RGB-Graph and

QRGB-Graph frame buffers to provide a complete Intel Corp. Multibus or DEC Q-bus 512- by 512- by 8-bit imaging system.

The units contain an on-board 10-MHz analog/digital converter for "grabbing" fields of video data with spatial resolution of 512 dots by 512 dots and with either 4 or 8 bits per pixel.

Prices start at \$2,150 (U.S.) for a 4-bit unit and \$3,150 for an 8-bit unit with delivery in four weeks from Matrox Electronic Systems at 5800 Andover Ave., TMR, Quebec City, Quebec, Canada H4T 1H4.

SEL Introduces 32-Bit Mini Line

(Continued from Page 51)

nization that puts all three systems in the two million instructions per second (Mips) category. "With cache hit-rates in the very high 90% range, the 32/67 line is capable of 2-Mips performance," he contended.

Other hardware components contributing to the systems' processing speed include an optional internal processing unit (IPU), which serves as a complement to the CPU and reportedly doubles the systems' performance, an optional floating point accelerator that can be attached to both the CPU and IPU, the Selbus synchronous bus that transfers data at 26.67M byte/sec and 16M-byte addressing capability.

The 32/6705's bare bones configuration consists of the CPU, an I/O processor, 8M bytes of main memory and a single cabinet containing rack space for additional disks and tapes. The 32/6750 basic configuration has the same features as the 32/6705, with the exception of 16M bytes of main memory and the ability to accommodate the optional IPU processor. The top-of-the-line 32/6780 features both the CPU and IPU as standard, with each processor having its own 32K-byte dual cache memory and 16M bytes of main memory.

The three systems are expected to be used in applications involving computer-aided engineering, simulation and in the exploration of oil and gas, the vendor said from 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

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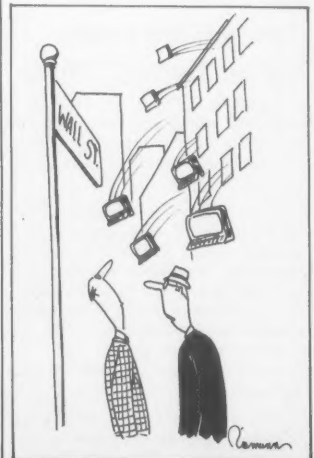
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Power Distribution System Unveiled by K/W Control

MIDDLETOWN, N.Y. — A Modular Power Distribution System (MPDS) said to fulfill changing computer room power distribution requirements has been introduced by K/W Control Systems, Inc.

The 415 Hz MPDS was designed to serve up to three separate computer loads from a single 75 kVA 415 Hz input, according to a vendor spokesman.

New CPUs can be added or relocated within the computer room without the need for any new wiring between the motor generator sets or paralleling system and the MPDS itself, according to the

spokesman.

The MPDS costs \$12,500 from the firm at R.D. No. 4, Box 114C, S. Plank Road, Middletown, N.Y. 10940.

Printer Prices Cut by \$600

FORT LAUDERDALE, Fla. — Southern Systems, Inc. has announced a \$600 price reduction for its Data General Corp.-compatible printer systems using the data channel controller.

New prices for data channel controller printer systems, typically used with DG's AOS operating system, are now \$3,500 to \$60,000, depending on the line print-

Design System Said to Save Engineers' Design Time

SUNNYVALE, Calif. — An interactive computer-aided engineering (CAE) design station said to cut engineers' design time by at least half

has been announced by CAE Systems, Inc.

The CAE 2000, based on the Apollo Computer, Inc. Domain minicomputer and the Bell Laboratories, Inc. Unix virtual memory operating system, comes with dual Motorola, Inc. 68000 architecture, 1M byte of main memory, 16M bytes of virtual memory and 34M bytes of local Winchester disk storage, according to a vendor spokesman.

Prices range from \$39,990 to \$88,690, depending on options, the spokesman said. The vendor is located at 1333 Bordeaux Drive, Sunnyvale, Calif. 94086.

Altos Users Get Disks

SAN JOSE, Calif. — Almaden Systems, Inc. has announced the ASI-8000 series of Winchester disk subsystems for Altos Computer Systems, Inc. microcomputers.

Available in 6M- to 19M-byte configurations, the subsystems use a proprietary host adapter and firmware to permit the subsystem to be directly attached to the Altos processor.

ASI-8000 subsystems cost from \$2,895 for a 6M-byte configuration to \$3,695 for a 19M-byte configuration. The vendor is located at 6066 McAlbee Road, San Jose, Calif. 95120.

er speed required.

The firm's printers range from 55 line/min to 5,280 line/min. Print technologies include matrix, band and ion deposition. Southern Systems is located at 2841 Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Controllers Out Alone

STAMFORD, Conn. — Digital Associates Corp. has announced that its printer controller/interfaces are now available for purchase as stand-alone products.

This line of controllers reportedly provides plug-compatibility with a range of computer systems including Digital Equipment Corp.'s VAX-11, PDP-11, LSI II and PDP-8 families and IBM's Series/1 and System/34 and System/38 computers.

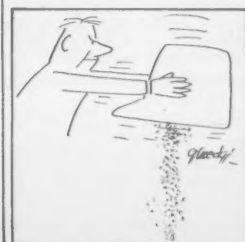
The controller/interfaces range in price from \$395 to \$2,500, depending on the system. Further details are available from the vendor at 1039 E. Main St., Stamford, Conn. 06902.

Analyzer Unveiled

ORANGE, Calif. — Wilson Laboratories, Inc. has announced the latest member of its family of dual-microprocessor peripheral analyzers.

The MWX-1000 provides fully automatic, semiautomatic and manual testing and analysis of interfaced drives and provides for the automatic logging of test results through a serial printer port, the vendor said. All functions of the drive can reportedly be tested, including bad track and/or sector locations, margins and timings.

The MWX-1000 costs \$5,995, the vendor said from 2237 N. Batavia St., Orange, Calif. 92665.



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	LA12A Portable DECwriter	2,950	280	155	106
	VT100 CRT DECscope	1,695	162	90	61
	VT101 CRT DECscope	1,195	115	67	43
	VT125 CRT Graphics	3,295	315	165	119
	VT131 CRT DECscope	1,745	167	93	63
	VT132 CRT DECscope	1,995	190	106	72
TEXAS INSTRUMENTS	VT180AC Personal Computer Option	2,395	230	126	86
	T1745 Portable Terminal	1,595	153	85	58
	T1765 Bubble Memory Terminal	2,595	249	138	93
	T1740 CRT	1,795	173	96	65
LEAR SIEGLER	T1785 Portable KSR, 120 CPS	1,795	173	96	65
	T1787 Portable KSR, 120 CPS	2,195	211	117	80
	T1810 RD Printer	1,695	162	90	61
	T1820 KSR Printer	2,195	211	117	80
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	CIT-161 Color CRT	1,525	147	82	55
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	953 CRT Terminal	850	82	48	31
	950 CRT Terminal	1,075	103	57	39
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	Letter Quality 7725 KSR	3,195	307	171	115
GENERAL ELECTRIC	2030 KSR Printer 30 CPS	1,195	115	67	43
	2120 KSR Printer 120 CPS	2,195	211	117	80
EPSON	MX-80 F.T. Printer	795	77	42	27
	MX-100 Printer	895	86	48	32
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Method to Madness Seen in 8-Bit-Based Systems

(Continued from Page 51)

able and a relatively small amount of 16-bit software — especially 16-bit software that requires a true 16-bit machine," Jon Shirley, Tandy's vice-president of merchandising, said. "The number of packages in that market [16-bit] can almost be counted on a couple of hands.

"For this reason, I think the 8-bit market will remain reasonably alive for another few years," Shirley observed.

He added that owners of small businesses "really don't care" whether their systems contain an 8- or 16-bit chip, as long as it solves their accounting and inventory problems.

Early in January Tandy delivered a C language, a version of Microsoft

Inc.'s Basic interpreter as well as Microsoft's multiuser Xenix operating system.

Mike Skelton, marketing director for Altos, agreed with Shirley that the 8-bit system will continue to thrive — at least for the next two or three years — in the business market.

"There are a number of people out there that are completely satisfied using 8-bit software and have absolutely no need to go to 16-bit. What we are doing with this product [the 580-10] is extending the life of our 8-bit products for another two or three years. With multiuser capability and a hard disk, it is as state-of-the-art as a [Zilog, Inc.] Z80 system can be," Skelton asserted.

Both vendors realized they would have to come up with more than just another 8-bit, single-user, floppy-disk-based system if they were going to distinguish themselves in the business marketplace. For that reason, Altos equipped its 580-10 with a 10M-byte hard disk and multiuser capability, while Tandy has also made a 12M-byte hard disk available for its TRS-80 Model 12, as well as a six-slot card cage that allows it to be upgraded to a 16/32-bit system.

"There is no doubt that a 16-bit system is better equipped for multiuser applications. When you start adding lots of users, you degrade the efficiency of the system. But with only three terminals, our system can handle it. The only problem you get

into is if you have a floppy-based system where you have a very slow access time to the data, but we have the hard disk," Skelton noted.

Reduced Access Time

Skelton said the company has not only added memory capacity to the 8-bit system by adding a hard disk, but has made it a viable multiuser system by reducing its CPU's access time to the hard disk from 150 nsec to 90 nsec.

"If we were a start-up company, we would rather come out with a [Motorola, Inc.] 68000-based system running 16 users rather than a Z80 product. But you have to understand a large percentage of our sales is still 8-bit and we have a lot of accounting, word processing and financial packages available," Skelton said.

The biggest problem facing 16-bit computer systems, which is proving to be a boon to 8-bit processors, is the lack of an adequate library of 16-bit programs.

One 16-bit system that has helped prolong the life of 8-bit systems in the business market because of its lack of software is Tandy's own Model 16. While the dual-processor system could draw on the large existing base of Z80-compatible software immediately, the higher level languages that would allow development of 68000-compatible application software and permit the system to use its multiuser capabilities were not made available for almost a year after the system was introduced.

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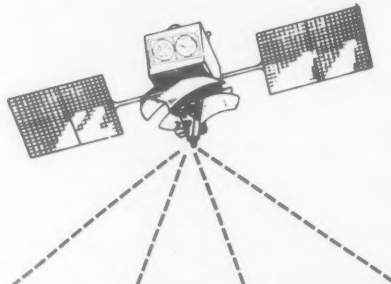
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Remember to look for *Computerworld On Communications* on May 18th and again on September 28th (advertising deadlines April 8th and August 19th).

For advertising information on *Computerworld On Communications*, call Bill Dwyer, National Accounts Manager at (617) 879-0700 or your local *Computerworld* sales representative.

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OMNIOFFICES

NYC Pleased With WP System Evolution

By Bob Johnson
CW New York Bureau

NEW YORK — Sophisticated applications and advanced office automation equipment rarely come to mind when one thinks about a large city municipal agency. Normally, shops outside of the private sector are thought to be at least five years behind the times. There is a glaring exception, however, one which originates from the largest user area in the country — New York.

The Department of General Services' (DGS) Division of Financial Management and Administration (DFMA) for New York maintains a Wang Laboratories, Inc.-based word process-

ing and DP operation that the agency claims serves some 350 users with 70 terminals, encompasses three buildings, has a nine-terminal WP training center and saved one of its divisions over \$40,000 alone last year.

terminals and peripheral equipment rose at a rate of 30% every six to 10 months.

According to the DFMA's director of WP management, Dean Plummer, the combination of user-driven capacity needs, a clear career path outlook and a positive push from the DGS' Commissioner's office prompted a swift upgrading of the systems. "The users became addicted to the system once it was in use. The people who took to it began to brag about how it helped and word of mouth spread. And of course, the creatively lazy types saw that it was better to do things on the Wang than on a typewriter," he said.

Plummer added that the former commissioner of the agency who was in charge at that time also contributed to the acceptance of office automation by refusing to read any output which was not produced on the in-house systems.

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Gemini System Gets File Searcher

NEW YORK — An electronic file software package for its Gemini office automation system was introduced by Syntrex, Inc. here last week.

The Electronic File Room (EFR) is capable of finding any kind of data within an electronic file by building an index to every document in the file and using every word in the document, according to Syntrex.

The company explained

that any document can be retrieved by naming a few words that were used in the text. The EFR searches across the electronic file hierarchy as well as file rooms linked together by local-area networks, Syntrex said. It can also search based on criteria not contained in the text.

Another feature of the EFR is a no-fail system with built-in duplicate monitoring. All incoming information is recorded on separate

hard disks connected to each half of the package. If a malfunction occurs, operations are transferred to the good half and a built-in Service Genie automatically dials a Syntrex service center.

The EFR is immediately available and is priced at \$3,900. More information is available from Syntrex at 246 Industrial Way W., Eatontown, N.J. 07724.

Sanyo Offers FAX Product

NEW YORK — Sanyo Business Systems Corp. has introduced a facsimile machine that reportedly is compatible with all other facsimile machines and that transmits in as little as 20 seconds.

The Sanfax 825 also features automatic answer, automatic speed/mode selection and automatic paper cutting. The automatic size reduction scales copy down from 10 in. to 8½ in., and the document feeder transmits stacks of up to 30 documents.

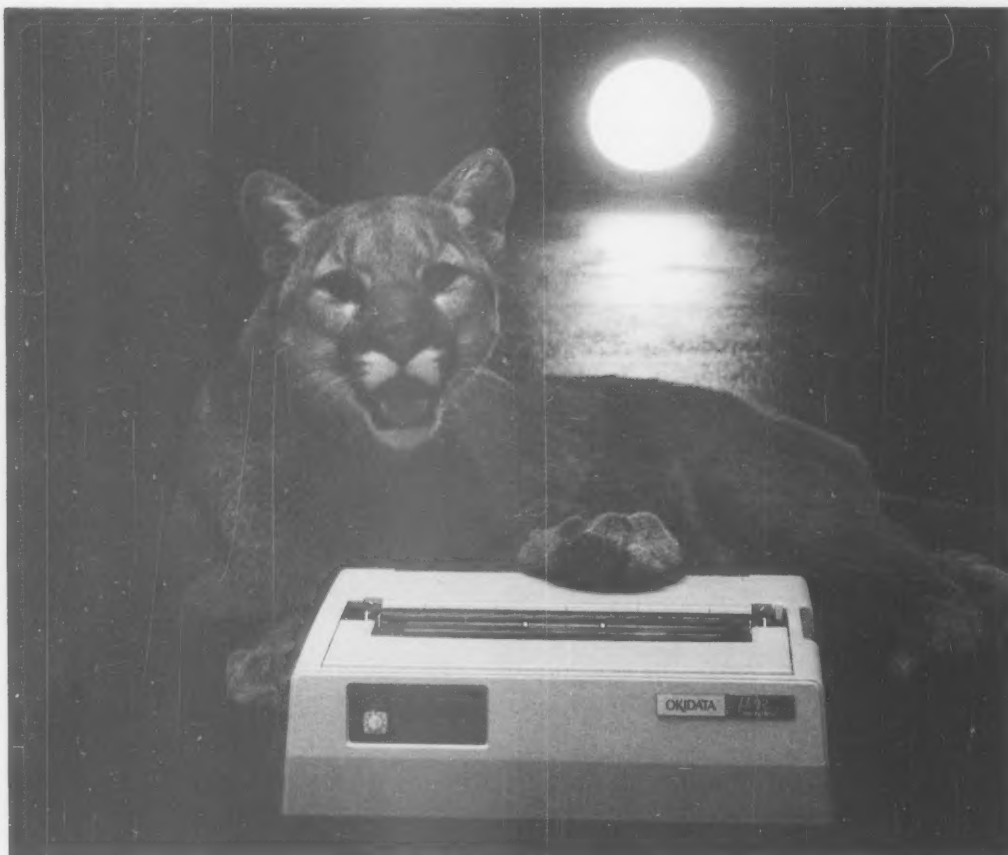
The facsimile machine is available for \$7,500 from Sanyo Business Systems, 51 Joseph St., Moonachie, N.J. 07074.

City Updates WP System

(Continued from Page 59)

CPU with 3M bytes of core storage and 300M bytes of removable disk storage. The shop also has three telecommunications lines: one is hooked up to the city's central IBM mainframe at the Division of Computer Services (DCS); another accommodates batch transfer processing over Manhattan Cable TV data transfer lines — the DFMA noted that the use of the cable TV lines will save the city nearly \$100,000 in fiscal year 1984 — and the last connects to a financial data base. The DFMA is also two-thirds of the way through the installation of Wangnet local-area networks, Plummer said, which will eventually link all of the agency's three buildings.

Two Wang band printers for local printing and two LPS-12 laser printers connected to the system at the DCS are also part of the system, Plummer noted. Additionally, an OBM Corp. optical character recognition device is now being used for hand written numeric recognition of payroll applications and the tracking of a bus-stop guide application that the DFMA said fit well into the system's WP and communications capabilities.



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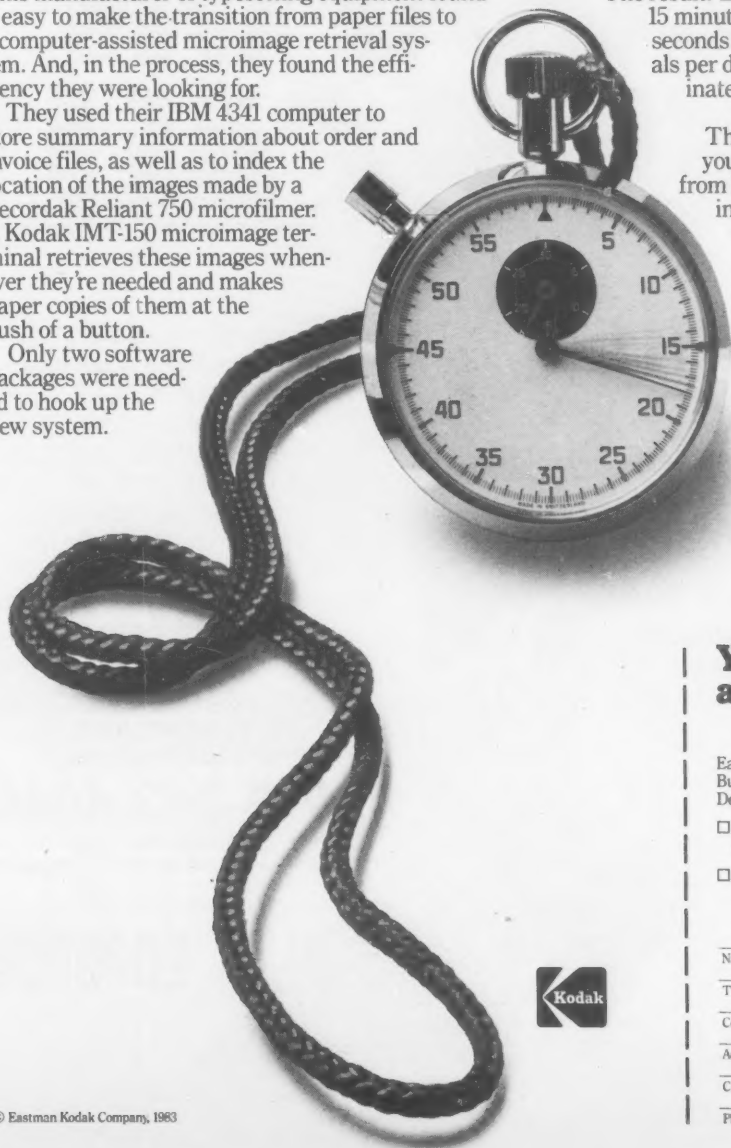
They used their IBM 4341 computer to store summary information about order and invoice files, as well as to index the location of the images made by a Recordak Reliant 750 microfilmer. A Kodak IMT-150 microimage terminal retrieves these images whenever they're needed and makes paper copies of them at the push of a button.

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For New CAD/CAM Strategy Perkin-Elmer in Pursuit of OS Experts

By Bill Laberis
And Lois Paul
CW Staff

WALTHAM, Mass. — Perkin-Elmer Corp. is hunting for IBM OS experts as it prepares to sail a new tack in its long-range computer-aided design and manufacturing (CAD/CAM) strategy.

With what company officials promise will be "a major and important announcement" in late April or May, PE will begin to drift away from an IBM host-based CAD/CAM environment to one anchored solely by PE 32-bit minis.

The key to this change in long-term strategy lies in PE's ability to convert more of IBM's CAD/CAM applications to run under PE's operating software.

Barry Rosenbaum, director of PE's recently formed CAD/CAM group, said in an interview last week, "Our approach will be to take advantage of the fact that almost all the [CAD/CAM] software written in the world runs on IBM.

Independent Strategy

"Our new strategy is to become more independent of an IBM host system in the CAD/CAM environment," Rosenbaum continued. "We want to be able to go to a user and say, 'Hey, you don't need a host. We can give you everything you need.'"

Lee's Theory C Boosts ATS

Shop's Terms Keep Employees

By Marguerite Zientara
CW Staff

FREMONT, Calif. — Hundreds of dollars in monthly cash prizes, a presidential open-door policy and clearly stated career paths have pushed turnover below 10% at Advanced Technical Services, Inc. (ATS) here.

These and other attractions are manifestations of what ATS President and Chief Executive Officer Huey Lee calls his Theory C school of management. Based on common sense and the Golden Rule, Theory C underlies all activities at ATS, which provides printed wiring board assembly and manufacturing services for electronics firms here in Silicon Valley.

"Repetition of microtasks often leads

(Continued on Page 70)

Rosenbaum stressed that PE will continue to offer enhanced support for the legions of PE's minis operating in IBM host-based shops. But he also strongly hinted of PE's future CAD/CAM orientation with his claim that "only about 10% of the [CAD/CAM] users really require a big

PERKIN-ELMER

host to do business."

And for those users requiring a host-based CAD/CAM system, Rosenbaum said PE "fully intends to come up with our own host system, one that will be based around our own multiprocessors."

IBM's Program Restrictions Get Mixed Reviews From Vendors

By Bill Laberis
CW Staff

WHITE PLAINS, N.Y. — The vendor community jury may be out for a while more before a consensus is reached on IBM's recent announcement that it will re-

PE has been competing in an IBM CAD/CAM environment since the '70s, Rosenbaum said, when Lockheed Corp. converted its Cadam software, formerly run on IBM machines exclusively, to run on PE systems. Lockheed has 55 PE processors running Cadam, and PE began marketing the package about a year ago, Rosenbaum said.

Cadam essentially allows much of the actual CAD/CAM processing to be accomplished by the PE machines, with the IBM mainframes serving to maintain a data base of drawing files.

But with its recent advertisements in search of OS support specialists, PE is looking to expand its Code Compatible Machine, which Rosenbaum described as

(Continued on Page 72)

strict or eliminate program materials from certain of its licensed programs.

Some vendors contacted last week said the policy change will have little or no effect on current or future operations, while others expressed a sense of foreboding that IBM is flexing too much muscle over independent software vendors, particularly system software houses.

But everyone contacted agreed on one point: The full impact of the IBM an-

(Continued on Page 76)

Micros, ICs Prod Software Design

By Robert Batt

CW West Coast Bureau

The proliferation of microcomputers in large corporations and the growth of the information center are the main forces propelling the strategies of leading software vendors in 1983.

This conclusion was reached from a series of telephone interviews conducted recently with major software houses around the nation.

(Continued on Page 66)



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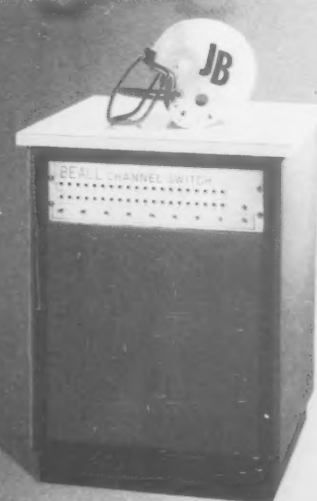
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COMPUTER INDUSTRY

Court Upholds IBM-Transamerica Decision

SAN FRANCISCO — A federal appeals court has upheld a lower court decision that exonerated IBM of charges that it violated anti-trust law as charged by

Transamerica Corp. Transamerica's former computer leasing wing had charged that IBM had monopolized the computer and peripherals markets, using

predatory pricing to drive out its competition.

The appeals court ruled it would be difficult to distinguish between predatory pricing and legitimate price

cuts designed to meet or beat the competition. This ruling upheld one reached by a dis-

trict court judge in 1979, handed down after a 120-day trial ended in a hung jury.

Micros Prod Software Vendors

(Continued from Page 65)

Outlining the problem facing vendors, John Cullinane, president of Cullinane Software, Inc., formerly known as Cullinane Database Systems, Inc., explained: "The twin dilemma

They plan to do this by supplying more on-line products and by providing integrated support for those personal computers that are now infiltrating large corporations.

John Imlay, chairman of MSA, Inc., said a major focus of his company's efforts this year will be to provide a combination of micro and mainframe software. "The personal computer has become a workstation, of which there will be 35 million by 1990. Users are looking at mainframe software as a source of data to be accessed by middle managers as well as DP professionals. At the same time, DP needs to retain some control over the transmission of data from a mainframe to a micro."

At McCormack & Dodge Corp., the emphasis is on providing two-way access linking micros and mainframes. In addition, the company claimed it is spending a lot of time and money developing generic software code that will perform typical functions common to many applications.

"Micros are going to be everywhere doing everything, particularly in large companies. At the same time 70% to 90% of business applications require the same software application functions," noted Jim McCormack, chief executive.

According to Jack van Kinsbergen, president of Boole & Babbage, Inc., support services are going to be vital to the success of software companies in the '80s. "The information center will require huge data centers and it is important that the user can plan and predict what demand in the data

center is going to be. For users to do this they need more sophisticated tools than are now currently available. Users are going to demand ever greater support because with everybody going on-line, there is a demand for faster response times."

Van Kinsbergen said Boole & Babbage will concentrate this year on its new Information Resources Planning and Control product,



John P. Imlay Jr.

of the '80s for data processing will be to reduce the applications backlog and to support users via the information center concept."

The requirements to implement this concept are demanding, Cullinane said. "By definition, the information center should provide direct access by all decision makers to pertinent information. The obstacles have always been that the software available and thought to be user-friendly does not have direct access to the production data bases. And quite frankly, those same languages lack sufficient power," he added.

In an attempt to solve these difficulties, several software vendors are developing decision support systems that they hope are comprehensive enough to meet the requirements of the information center concept.



John Cullinane

reportedly designed to provide both a capacity planning and performance management capability.

Merritt M. Lutz, group vice-president at Informatics General Corp., agreed that support services are going to be vital to overall success.

"Successful companies will have the ability to develop strategic products, that is, products that users can rely on," he said. "The choice of software is now as strategic a decision as the choice of hardware, and the sophisticated user is looking for long-term solutions to his problems."

Lutz said a key part of Informatics' strategic planning is to create data bases that are relevant to individual entities within a corporation.

Prime Discount Schedule Out

NATICK, Mass. — A hardware discount schedule is the backbone of the Authorized Distributor Program introduced recently by Prime Computer, Inc. The program was designed to blend Prime's former value-added remarketer, dealer and system builder channels into one cohesive distributor network.

The program enables system houses to expand vertical market penetration by reselling their applications software on the company's line of 32-bit systems.

"We intend to strengthen our relationship with current Prime resellers, expand our distributor network and deepen our market penetration," a spokesman said.

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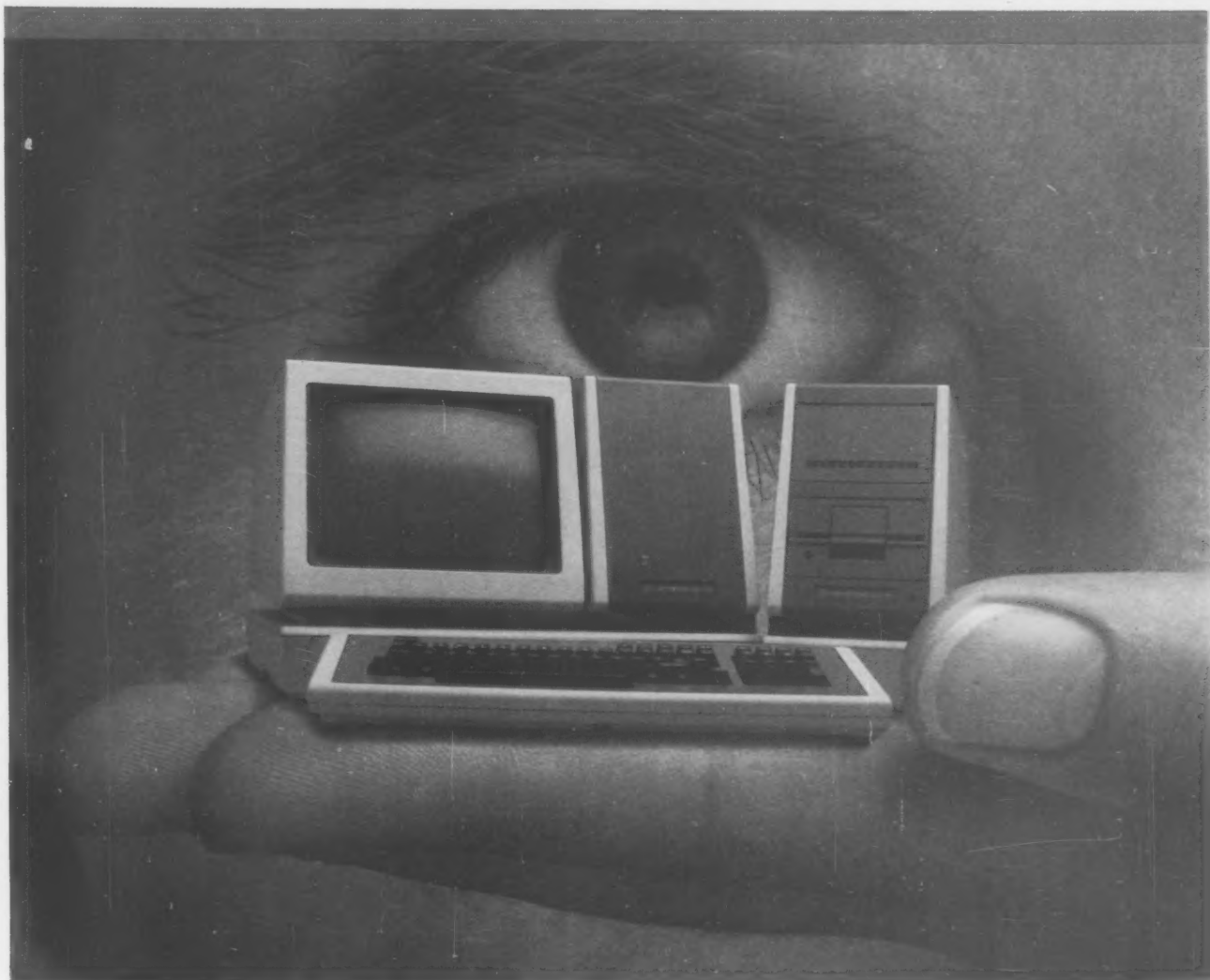
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CSC Goes to Trial May 16 on Bribery Charges

By Jake Kirchner

CW Washington Bureau
ALEXANDRIA, Va. — A federal judge here has set May 16 as the date for the trial of Computer Sciences Corp. (CSC) and five former and current employees charged with bribery and overbilling in connection with a large federal time-sharing contract.

The trial on the October 1980 indictment was delayed

two years after presiding Judge Richard L. Williams dismissed the charges on procedural grounds. Most of the 57-count indictment was later reinstated by a federal appeals court, although more serious charges against CSC of bribery, racketeering and conspiracy were thrown out.

Those counts and charges of wire and mail fraud in connection with billing the government remain against

the firm's employees: John W. Luke, former president of the company's Infonet Group, which obtained the contract, and Infonet employees Thomas A. Marti and Norman W. Derrick. Other defendants are former CSC employees Erwin L. Allen, one-time Infonet vice-president, and Peter C. Loux, former CSC branch manager. Also indicted on these charges was Herbert G.

Blecker, president of Icarus Corp., a Maryland subcontractor to CSC on the Infonet contract.

CSC must defend itself against lesser charges that it fraudulently overbilled the government as part of its National Teleprocessing Services Contract, which brought CSC more than \$100 million between 1972 and 1977.

The original indictment

said the defendants conspired to bribe James C. Lindsey, a General Services Administration contracting officer, who allegedly gave CSC employees inside information on the contract bidding in return for \$34,000 and a job with a separate corporation set up by CSC to hide the fact the firm was Lindsey's real employer.

In addition, the indictment charged the defendants with billing federal agencies at a higher rate for time-sharing services than paid by Infonet's commercial customers.

According to information obtained by the Justice Department during its investigation of the Infonet contract, CSC went to great lengths to hide the rate difference. A former CSC-retained attorney said that this allegation included a CSC decision not to defend itself against an unrelated lawsuit after Infonet's Allen realized the action might disclose the firm's billing practices.

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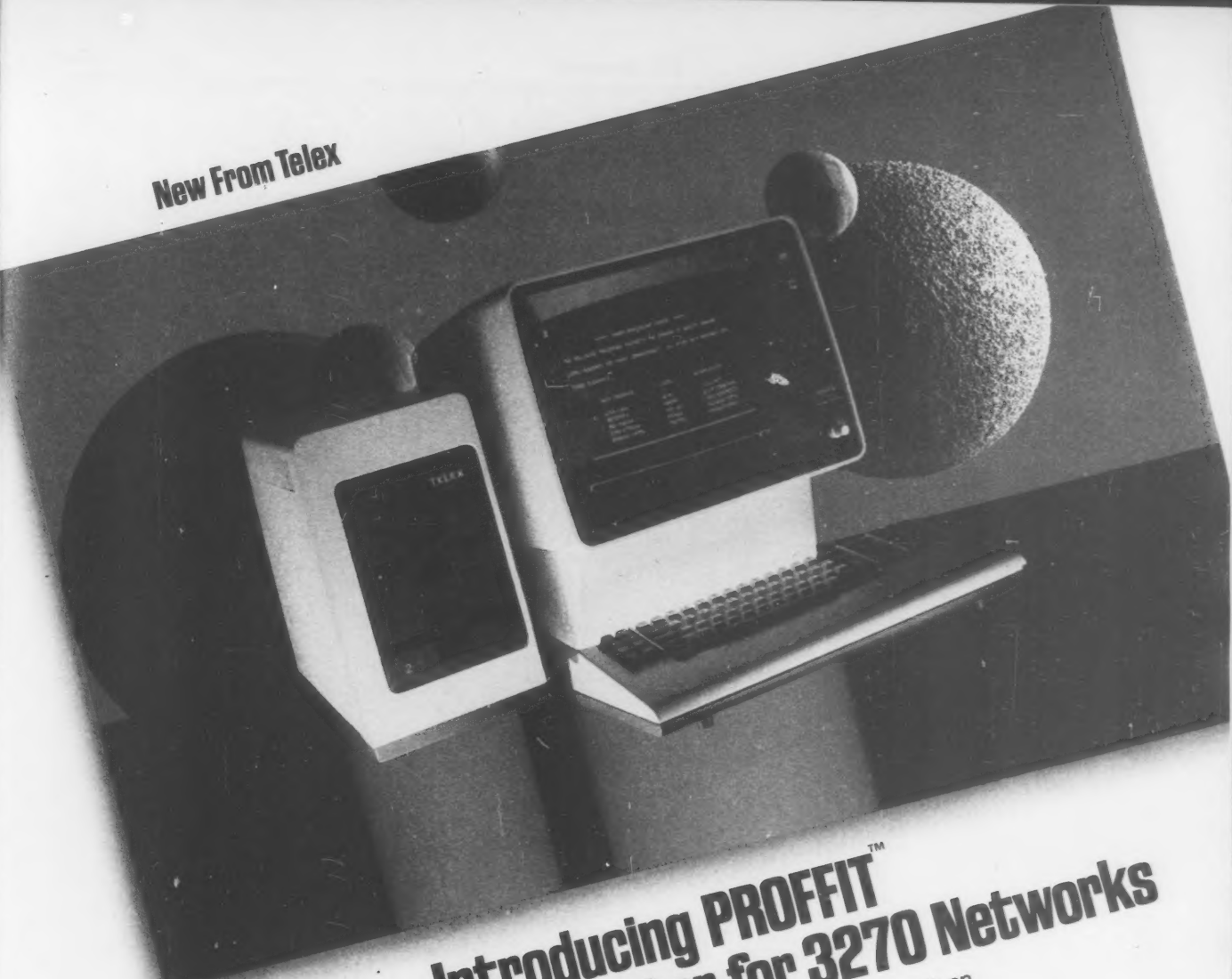
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ATS' Founder Lee Practices What He Dreamed

FREMONT, Calif. — It was 30 years ago that Huey Lee emigrated penniless from China to California.

He enrolled at San Jose State University, where he received a bachelor's degree in electronic engineering. He then studied biomedical engineering and digital system design at the University of Santa Clara, while working toward a master's degree in business administration there.

Prior to founding Advanced Technical Services, Inc. (ATS) in 1977, Lee worked for several Silicon Valley electronics firms, in addition to inventing and marketing medical electronics devices with his wife, May, a medical technologist.

"When I was an employee, there

were a lot of things that I was telling myself, if I were the employer this is what I wanted to do," Lee recalled.

Market research studies Lee undertook in graduate school alerted him to the need for electronic manufacturing firms, so he founded ATS. "When I started the business, here in Silicon Valley, talent was very hard to find," Lee explained.

"I was looking for a method from which I could obtain and acquire the talent as well as keep the talent," he added.

"I did a very extensive survey on the personnel management of many companies and put that together with my personal experiences.

"In addition, I read a lot about Theory Z and I found out that really

there aren't too many secrets in this personnel management business."

"All I have to do is use my com-

mon sense, treat people the way I want to be treated myself, put myself in their shoes and think that way.

ATS Working Conditions Attract, Keep Employees

(Continued from Page 65)

to low morale, absenteeism, poor quality control and high turnover," Lee pointed out. Taking aim at these problems, Lee translated the Golden Rule — "Do unto others as you would have them do unto you" — into working conditions he hoped would attract and keep workers.

Much of Lee's theory — which he

concedes "sounds simplistic" — comes from his two years on the assembly line in the early days of ATS. Although he was the company's founder, with only five employees in 1977 Lee found himself jockeying between assembly and management jobs.

But it is not only assembly line workers who are said to benefit from Theory C. ATS now employs 300 people who reportedly gain from Lee's experience and empathy.

For example, Lee assigns top priority to listening to employees. "People can knock on my door anytime," Lee said. "If I'm with a client, I'll get back to the employee as soon as possible."

Open-Door Policy

"An open-door policy gives employees a direct pipeline to the top — for discussing suggestions, grievances or personal problems," Lee said. "They're reassured that someone will listen to them — and act, if necessary."

Does such a policy cause bad feelings when an employee goes over the head of his immediate supervisor? "No," according to Lee, "because I instruct my managers to be open to that type of situation. As long as the problem is solved, that's what we're interested in; we're not interested in pointing fingers."

"Workers are told to go through the chain of command and to come to me only if they get no satisfaction," he added.

"And our basic management training includes three months of 'boot camp,' when trainees work side by side with assemblers, so they know what the issues really are."

Other Examples

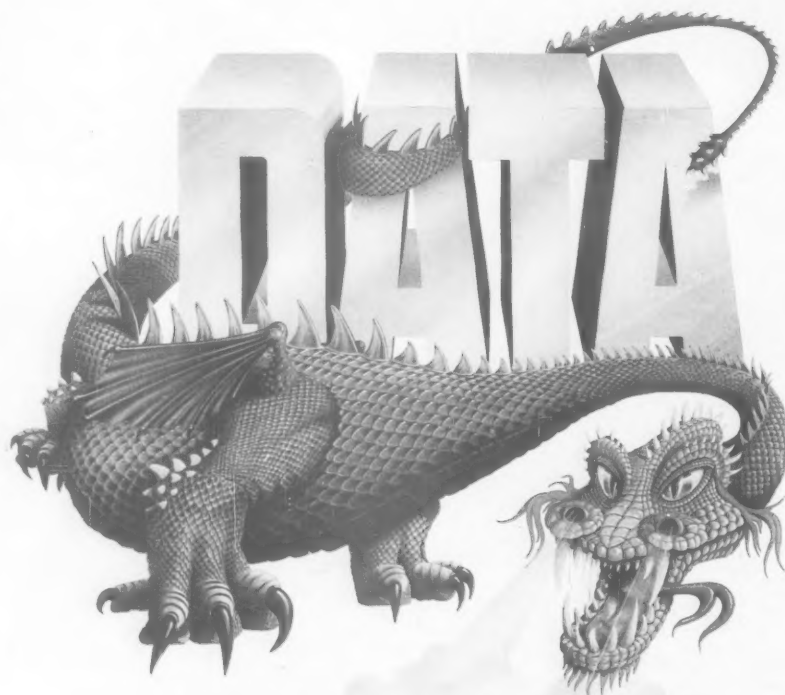
Other examples of bottom-up communication include quality circle meetings and employee-management group discussions.

Furthermore, in a labor-intensive industry like electronic assembly, the key to profits lies in motivating people to maintain good attendance and produce quality work.

To that end Lee has developed an incentive program in which he gives away about \$50 monthly to five or six employees with perfect attendance and to three "Employees of the Month," who are judged on "cooperation, attitude and performance," he explained. Attendance has increased by 20% to about 90% since the program started, he noted.

In addition to general meetings, ATS schedules special meetings for high-level executives and for lower management. Management totals about 25 people.

ATS has also established a point system for evaluating employees. Those who excel receive four raises a year.



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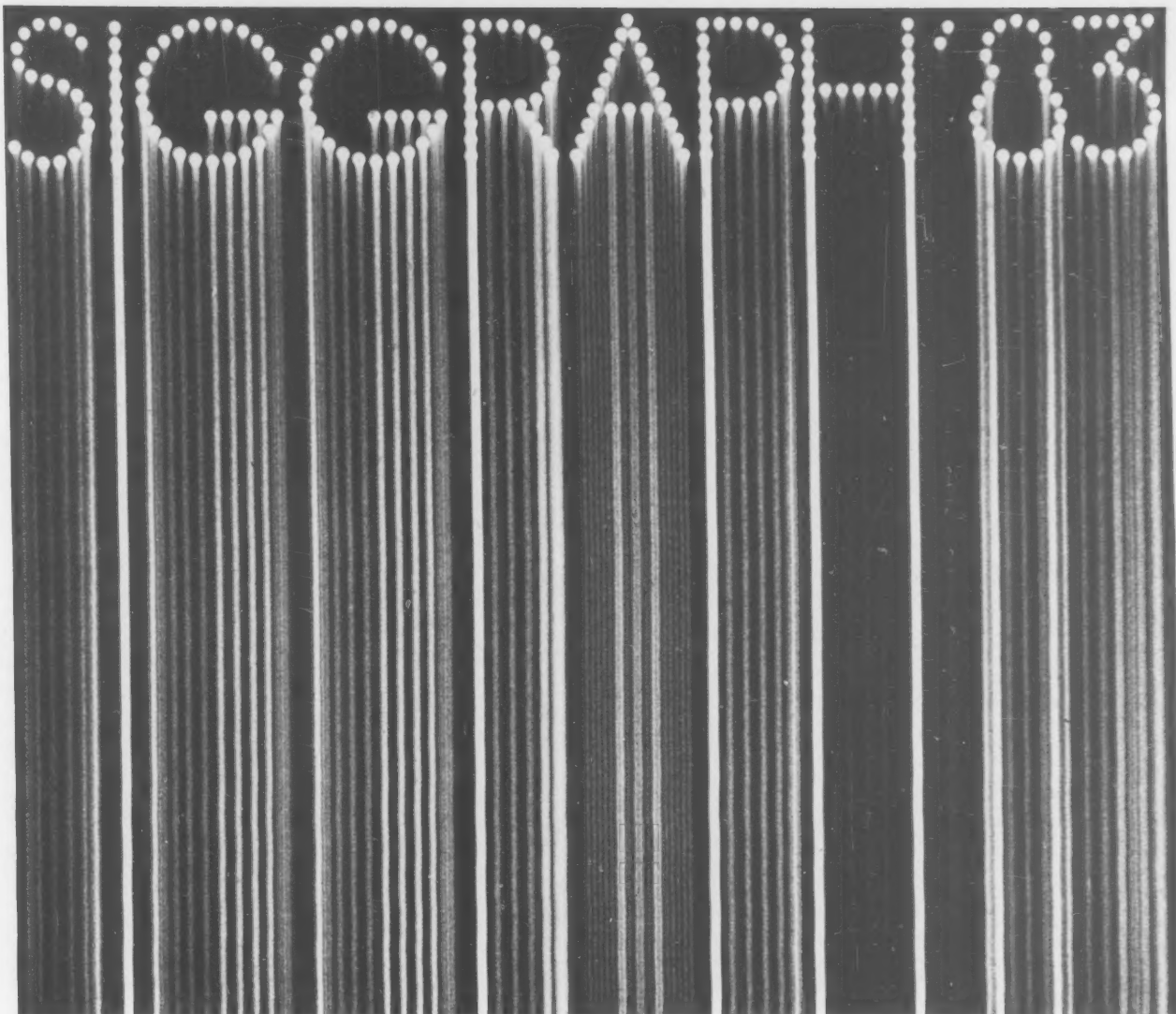
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Geared to Small Business

DEC Retail Outlets Renamed

MERRIMACK, N.H. — The Digital Equipment Corp. retail computer outlets have been renamed Digital Business Centers and recommitted to "developing computing solutions exclusively for small businesses and professional offices," the company announced.

The 25 stores will now, among other things, be used to demonstrate DEC's VAX-11/730 and PDP-11 minicomputers. The first cities targeted in the effort include Miami, Baltimore, Cherry Hill, N.J., and San Antonio, Texas. The centers will offer general accounting solutions for small businesses and professionals and will target vertical industries.

In addition to the minicomputer

demonstrators, the centers will carry a line of printing devices, accessories, supplies and tailored software packages, DEC added.

Tymnet Announces Expansion Plan

SAN JOSE, Calif. — Tymnet, Inc., a subsidiary of Tymshare, Inc., has announced an expansion program that reportedly will extend local phone-call access to its public packet data communications network from an additional 150 U.S. cities.

Thus by midyear, users in more than 400 U.S. cities will have local

access to Tymnet, according to the firm. The expansion will also provide additional access ports in existing cities and increase the number of high-speed ports by upgrading local-access facilities. Local availability of data services reportedly will be extended to most locations with populations of 85,000 or greater.

National Semi, DTS Deal on Hold

SANTA CLARA, Calif. — The Antitrust Division of the U.S. Justice Department wants to see more information on both companies before it will approve the intended acquisition of Data Terminal Systems, Inc. (DTS) by National Semiconductor Corp.

Because of the Justice Department request, National Semi has announced that it will extend its offer to purchase 4.3 million shares of DTS stock until March 7.

This marks the second time since the acquisition announcement of last month [CW, Jan. 24] that the government has asked for more market and company information.

PE Eases IBM Out of Strategy

(Continued from Page 65)

firmware emulation of certain portions of an IBM instruction set.

Rosenbaum said the software emulation will not make plug-compatible machines out of PE processors, as the PE machines will not run under IBM's operating systems and will not support IBM-compatible peripherals.

'Screwing Around'

Speaking of PE's ongoing software conversion effort, Rosenbaum said, "It turns out that all the screwing around that we do when we attempt a conversion usually involves some strange usage of the IBM operating system by the applications program. I basically want OS experts to figure out what the applications program is trying to do and to figure out how we solve that problem on our own system. This is altogether different from our current strategy, which is to be anchored to the IBM host."

Thus, PE appears to be positioning itself to compete more effectively and independently in what is a burgeoning CAD/CAM marketplace.

A recent study of Predicasts, Inc., a Cleveland consulting firm, estimated that the CAD/CAM applications market will grow by 41% annually throughout the early '80s and that the 4,600 installed CAD/CAM systems in place at the end of 1981 will blossom to 190,000 in 12 years [CW, Oct. 18].

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Over Possible Trade Wars Futurist Paints Bleak Picture

By Jake Kirchner
CW Washington Bureau

With the growing sentiment in the U.S. and abroad for increased trade restrictions aimed at protecting native industries, the outlook for American DP and telecommunications vendors and users grows bleaker every day. One industry executive, Charles P. Lecht, sees nothing good resulting from this possible trade war between the U.S. and its trading partners.

Among other likely effects of a high-technology trade war, there would be a drastically diminished American influence in the world's computing community, predicted Lecht, president of Lecht Sciences,

Inc. and former chairman of Advanced Computer Techniques Corp.

"In the computer manufacturing area, one thing you might note," he said, "is that virtually 100% of all the [million instructions per second (Mips)] being used in the world are being used on computers of American manufacture and/or design. The only viable products in companies such as ... [ICL Ltd., Olivetti Co., Toshiba Corp.] and NEC are all ... of American manufacture and/or design. So insofar as increased trade isolationism [is concerned], all that will do is stimulate a trend away from that and it will hurt the American manufacturers ... I'd say that within five years it will start to hurt us enormously. In the short term, it will aid our manufacturers to be able to ... purvey their systems in America like a controlled substance."

Even though some U.S. firms, notably IBM, derive as much as 50% of their revenues from overseas operations, Lecht said they could make up in U.S. sales the revenues they might lose if foreign markets are closed to them in retaliation for a closed American market.

"What [U.S. firms] see is the handwriting on the wall, anyway, because new, modern processors are clusters of chips from heterogeneous machines." This means, he explained, that "a product of Toshiba's original design, [for example], will in the future be able to run IBM programs," and, therefore, "the main impediment to switching to a computer which is of radically different architecture has been eliminated — namely, the need to convert."

"When the new processors emerge, like the Japanese fifth-generation computer, and that computer will run programs of foreign origin through emulation or even conversion, the motive not to buy the local system vanishes. You might say 'How the hell can they run it through emulation? It would never be as fast as with native code.' You might notice that the cost of modern computer systems is increasingly in the peripherals and not in the CPUs; therefore, many Mips may be wasted to provide emulation that looks like a virtual speedup without increasing the price of the computer materially at all."

According to Lecht, in a few years the CPUs in systems such as the IBM 4300 line will account for no more than 10% of the total system price. "So even if you double the Mips, it still wouldn't be 20% of the [total] cost ... This now will allow a company like [Fujitsu Ltd. or Siemens AG] to create processors that are much more powerful than they announce. And that extra power can be used to emulate foreign machines, machines in fact that previously gave [users] nightmares because of conversion problems."

Lecht added that this development is inevitable, no matter what the trade situation and reiterated that U.S. firms are well aware of this — a fact that will make it easier for them to support trade barriers, although they now fervently espouse free trade. "I think they are going to have

(Continued on Page 78)

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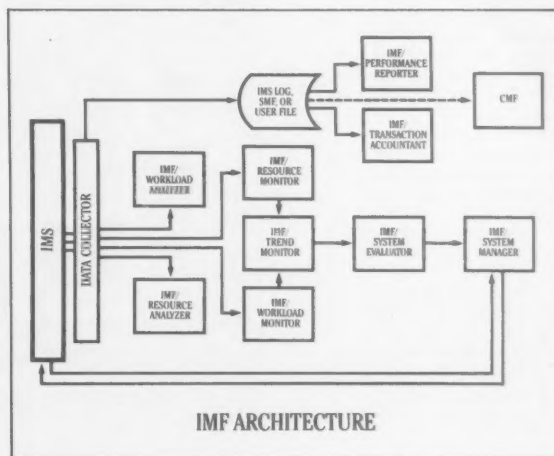
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NEW VISIONS IN SYSTEMS MANAGEMENT

IBM Program Restrictions Earn Mixed Reviews

(Continued from Page 65)

nouncement is impossible to gauge now, for systems and applications houses alike. Thus, some vendors are holding their breath in anticipation of the program access limitations, while others are clearly losing little sleep.

The announcement states that "for selected new IBM-licensed programs and selected new versions and releases of currently available programs, certain licensed program materials may be either made available on a restricted basis or not available."

The list of possibly restricted materials includes machine-readable source code, microfiche, logic manuals and selected basic materials, IBM said. Further, IBM will review licensed materials on an individual basis to determine what program materials will be distributed.

Restricted Materials

Henceforth, IBM will allow its customers to use restricted materials only "to interface user programs or products, to make user modifications or to perform problem determination, problem source identification and problem resolution activities."

In addition, IBM will prohibit reverse compilation or the running of object code through a compiler to produce source code.

The new terms are effective Sept. 1 for all current customers of IBM-licensed programs. For those requiring licenses with restricted materials prior to this date, the new terms will become effective when the programs are ordered.

Without being specific on what restrictions will apply to which programs, IBM announced that the following programs will contain "some" restricted program materials: MVS/SP JES 2 Version 2; MVS/SP JES 3 Version 2; Data Facility Product; TSO Extensions; RMF Version 3.1; Assembler H Version 2; Systems Modifications Program Extended; MVC/SP JES2 1.3.3; MVS/SP JES3 1.3.3; and VM/XA Migration Aid.

Industry Viability

Digesting the meaning of IBM's announcement, Martin Sprinzen of Candle Corp. said, "IBM officials have said that they are concerned with preserving the viability of the software industry, and, therefore, we have no reason to be concerned with these announcements."

Vince Rauzino, a consultant with Data Decisions, Inc., was considerably more concerned.

"By not providing the source code or by making it available on a very restricted basis, what they do is cut out the ability for anyone to do anything compatible," he said. "It is very, very difficult to reconstruct the source code."

For users, Rauzino said the implications of IBM's actions may be negligible at first, as they can still obtain licensed software without

any problems.

Rauzino tied IBM's latest moves into what he termed an overall strategy to develop greater market penetration in order to achieve "15% or 16% growth throughout the '80s."

Jack van Kinsbergen, president of Boole & Babbage Inc., said, "I don't have any big problem with it, because I have never had any difficulty getting what I needed

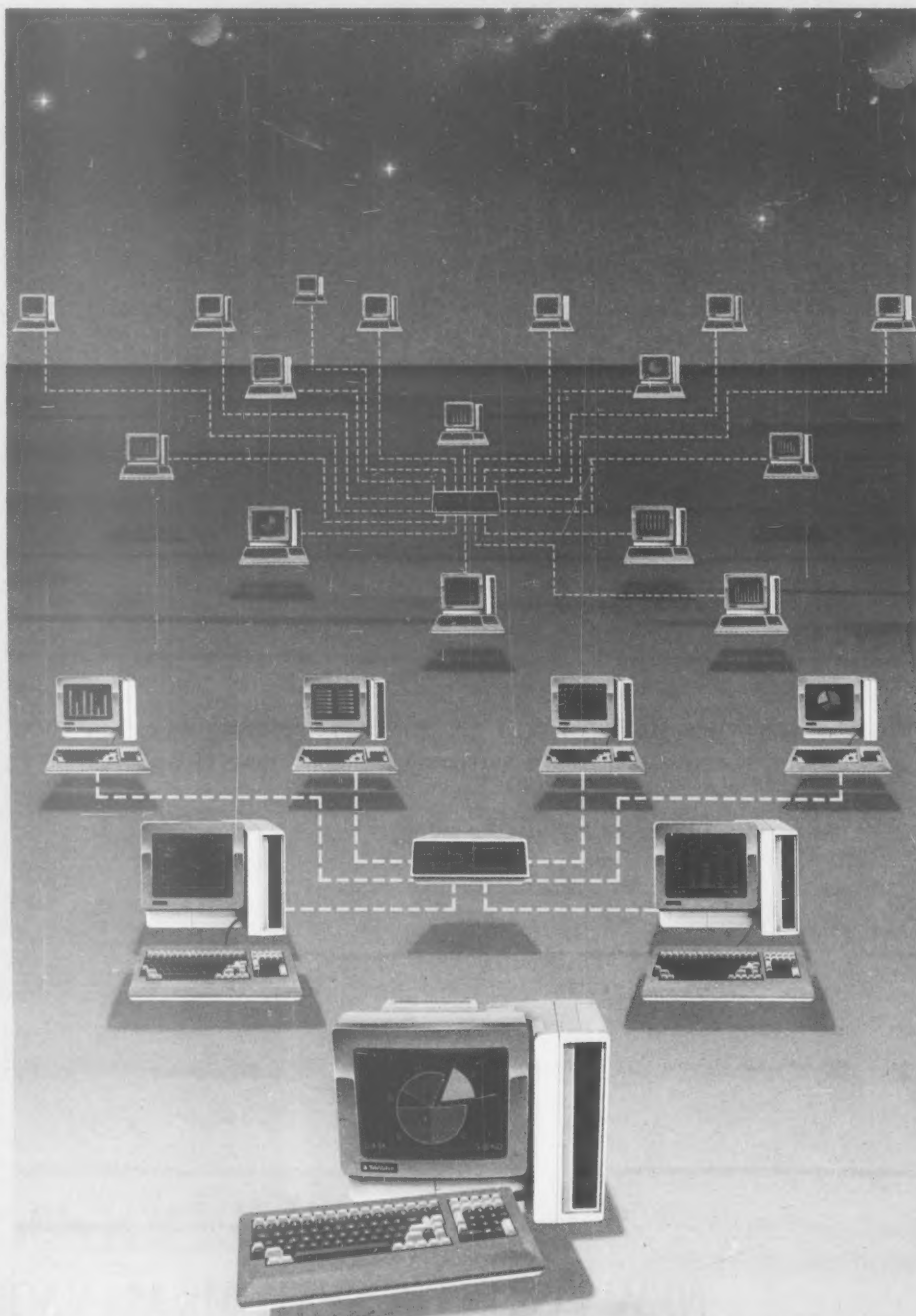
from IBM. I don't think they're going to do anything arbitrary that will cause us any major difficulty."

Asked how the announcement might affect users, van Kinsbergen said, "They need it because it is the most effective documentation."

Martin Goetz, vice-president of software products at Applied Data Research, Inc., said the announcements "could have a very strong

negative effect" on some software companies, particularly systems software houses.

"These vendors really have to know how a product works internally... The fact that they will not give out source code or logic manuals or give it out selectively strikes me as potentially very dangerous," according to Goetz. "I don't like it," he said.



Executive Corner

• **David J. Collard** has been promoted to vice-president of finance, administration and planning and chief financial officer at Prime Computer, Inc.

• **John J. Clancy** has been appointed senior vice-president, industry and production management, and **Charles M. Barlow** has been appointed senior vice-president of Health Services Division for McDonnell Douglas

Automation Co.

• **Larry Jordan** has been promoted to vice-president of marketing at SEEQ Technology, Inc.

• **Larry D. Owens** has joined Cado Systems Corp. as senior vice-president of systems.

• **William Lattin**, a vice-president at Intel Corp., has been named general manager of the firm's Systems Group.

• **Edward A. Grant** has been appointed vice-president of administration and human resources at Decision Data Computer Corp.

• **Harold Koplow**, formerly of Wang Laboratories, Inc., has joined Modular Computer Systems, Inc. as vice-president of research and development.

• **Joseph C. Ciasullo** has been elected executive vice-president, international op-

erations, and **Gary L. Asbell** has been promoted to vice-president and principal engineer at Datapoint Corp.

• **William Perry** has been promoted to vice-president and chief financial officer of Precision Visuals, Inc.

• **Peter Vostas** has been appointed vice-president, international marketing, and **John Mullaney** has been appointed vice-president of U.S. sales for Paradyne Corp.

• **James R. Krehbiel** has been elected vice-president of semiconductor operations, Semiconductor Division, for Intersil, Inc., and **Dr. Christopher K. Layton** has been elected vice-president of operations at the firm's Triangle Park facility.

• **Guy Daniello** has been elected president and chief executive officer of Datamedia Corp.

• **Thomas L. Hewitt** has been appointed vice-president, program development, of Computer Sciences Corp.'s Systems Group. **Richard B. Terhorst** has succeeded him as president of the Infonet Group's Government Systems Division.

• **Martin J. Chizzick** has been appointed corporate vice-president of international relations at Storage Technology Corp.

• **Alex Saunders** has been named vice-president and general manager of operations and **Dr. Mel Drossman**, vice-president, engineering and development, at Applied Digital Data Systems, Inc., a subsidiary of NCR Corp.

• **Peter Sulick** has been appointed vice-president and chief financial officer at Lifeboat Associates, Inc.

• **Jeffrey L. Zickler** has been promoted to vice-president, marketing operations, at MAI Applications Software Corp.

• **William Catania** has been appointed vice-president, customer service, at Decision Data Computer Corp.

• **Peter Cope** has been promoted to vice-president, European operations, for Allied Information Systems Co.

• **Robert C. McClelland** has been appointed vice-president of finance at Precision Monolithics, Inc.

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World DP Markets Seen Spiraling Toward PTTs

By Jake Kirchner

CW Washington Bureau

One underappreciated but important factor in the evolution of world DP markets, according to industry theorist Charles P. Lecht, is that many foreign industrial nations have postal and telecommunications agencies (PTTs). He predicted "with complete solidity, without qualification, that the computer businesses in all of the foreign countries ultimately [will] go under the control of the PTTs of those countries."

That, he said, is "another reason why it is bad to inhibit

it [foreign computer] manufacture and sale in the United States, because it will accelerate [putting foreign markets] under the PTT umbrellas of West Germany and France and England.

"And when it does [occur] we won't be competing any longer with [Siemens AG, ICL Ltd. or Olivetti Co.]; we're going to be competing with the local PTTs, [which will be] distributing data processing like telephone services. That's all right; we could sell into the PTT networks, but if we want to sell into the PTT networks we

want to be friendly with the governments that own them, because they're all government controlled.

"So if we erect trade barriers ... we'll be selling into these networks that are not of our design. Whereas if we would be a little kinder to foreign competition, the networks would be our design because they'd be using all of our technology. My theory is that it's easier to sell to a country where all the products have been designed in our country, notwithstanding their competition, than it is to sell into a country where the products aren't of your design, because then you have to go through what we claim the Japanese and others go through here — namely, finding out what the hell [the designs] are."

When asked if the seemingly intractable trade problems between the U.S. and Japan do not call for some

sort of U.S. trade action, Lecht replied: "I don't want to appear anti-American ... [but] I believe that ultimately our best interests are served with friendship with Japan, and if the Japanese can produce what we can produce for 50% the cost, we ought to buy it and make something else ... except for strategic materials." He added that "it is my theory that if Japan were allowed to sell computer systems into America the price would drop maybe 25%

to 50% of these systems we have now."

As far as computer users are concerned, Lecht predicted U.S. trade restrictions would mean higher costs. Ultimately, he said, "we have to balance the good of our computer industry with the good of the user community, and it seems to be a bottom-line statement that the user community benefits by free trade; the manufacturing community benefits by lack of it."

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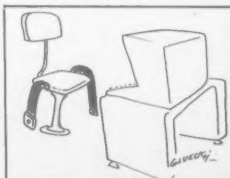
Futurist Fears Trade Wars

(Continued from Page 73)

to see a declining [world market] share. You may notice from statistics that have been around for the last couple of years that the American percentage of the foreign marketplace is dropping rapidly, but the American percentage of IBM or IBM-compatible products is increasing rapidly.

"This suggests that we're going to see a [market share] diminution abroad and the diminution is going to occur in the area of our greatest strength as a country — namely, IBM systems. And other people's systems which were, heretofore, incompatible can be run by brute force, Mips wastage in the mainframe of a foreign architecture."

Lecht said he has argued this point with government officials, telling them "if you put up trade tariffs which are prohibitive and you force these people into their own architectures, don't kid yourself." But, he said, U.S. trade officials "don't understand the computer business. They just understand moving cars." Rash trade actions on their part will only exacerbate the problems of U.S. firms trying to market abroad, he said.



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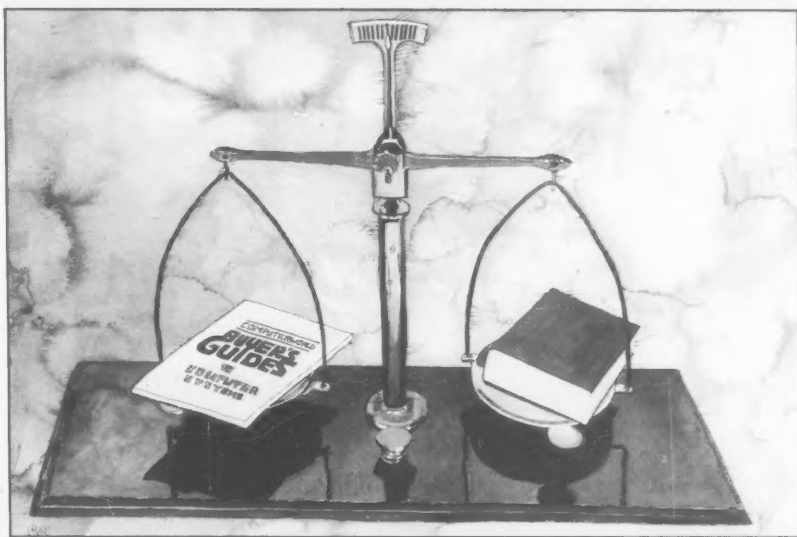
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As part of the largest private health insurance system in the world, Blue Cross and Blue Shield of Kansas City is a progressive organization where advanced automation and MIS will continue to play a central role in our success.

We are currently searching for a Sr. Data Base Architect. Responsibilities include providing the coordination, perspective and administrative service for corporate data bases through the design, definition, organization, access, efficiency and documentation of data bases. Requirements include 6 years demonstrated progressive responsibilities in DP to include systems analysis and design and IMS/VS data access control block specification and generation. Prefer experience in IMS/VS DB/DC performance, tuning and Data Dictionary.

Our environment consists of an IBM 3033 operating under MVS with IMS DB/DC. We offer flexible hours, highly competitive salary, and excellent benefits including a dental plan, credit union, educational assistance and relocation package. For immediate consideration, call Kathy Jensen, collect, 816-932-5262, or forward your resume, in confidence, to her attention.



**Blue Cross and Blue Shield
of Kansas City
P.O. Box 169
Kansas City, Mo. 64141**

Equal Opportunity Employer M/F/H/V

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NOW is the time to pursue an excellent career opportunity with Bowman Associates, one of San Francisco's most respected search firms. We offer:

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For consideration, please send resume or call, Gil Biggs, Bowman Associates, 595 Market Street, Suite 725, San Francisco, CA 94105. (415) 781-0717. EOE



**Bowman
Associates
Inc.**

Expansion of M.I.S. Creates New Career Opportunities

SYSTEMS ANALYSTS

Positions require degree and approximately 7 years total experience, with at least 2 years in systems analysis in design of on-line/real time applications. Must have experience with Burroughs medium or large systems. Should have experience in product movement and/or business systems applications.

PROGRAMMER ANALYST

Requires degree and 3 years experience. Must have COBOL (prefer COBOL 74) and experience with Burroughs medium or large hardware. Applications experience in product movement and/or business systems a plus.

TECHNICAL SUPPORT PROGRAMMER ANALYST

To support M.I.S. in data communication, distributed processing and resource management. Entails development of viable networking arrangements and support software, use of Burroughs processors and various analytical software to monitor effective resource use at mainframe and terminal levels. Requires Engineering or Computer Science degree, working knowledge of COBOL 74, experience with Burroughs medium systems and with design of application systems in Data Base/Data Communication environment.

**Competitive Salaries, Excellent Fringes
Top Relocation Assistance**

If interested, send resume to: PERSONNEL SUPERVISOR



**Badische Corporation
P.O. Drawer 3025
Anderson, S.C. 29621-0025**

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Haworth, Inc., a recognized leader in Office Interior Systems, has an immediate need for experienced Professionals in our Management Information Systems Department:

SENIOR SYSTEMS/ SOFTWARE PROGRAMMER

This senior level position is responsible for the leading and planning necessary for the design, generation and evaluation of operating systems and/or data acquisition systems. Will provide trouble-shooting support of systems problems with the assistance of application programmers and analysts, computer operations, and other computer users. This position is also accountable for setting guidelines and directions for software programmers.

The ideal candidate must be experienced in IMS and/or CICS with a strong general systems programming background. A bachelor's degree and five to eight years experience are required as well as excellent interpersonal communications and leadership skills.

SENIOR SYSTEMS ANALYST

Manufacturing Applications

This position is responsible for the planning, development, presentation, and implementation of manufacturing information systems and projects, and for coordinating work assignments within the unit.

The ideal candidate should possess a bachelors degree with at least six years job related experience, including systems design and related technical skills. Heavy experience in manufacturing systems is required. AMAPS exposure is desired. Must be able to communicate well with people on a variety of technical and managerial levels.

This may be your opportunity to move up to a top quality company that is dedicated to the growth and development of its employees. HAWORTH, a dynamic, rapidly expanding organization, offers a complete fringe benefits package and ample opportunity for advancement. If you are interested in either of these senior level positions, please send your resume in complete confidence to:

Chris Rozek
Placement Specialist

HAWORTH

One Haworth Center
Holland, MI 49423

Equal Opportunity Employer M/F

Opportunities In Saudi Arabia Data Base Analyst

For those individuals seeking a challenging and sophisticated environment in a multi-cultural setting, the King Faisal Specialist Hospital and Research Centre awaits you.

The Hospital, located in Riyadh, Saudi Arabia, is a 250-bed acute care facility dedicated to providing quality health care to the citizens of Saudi Arabia. The Information Systems Department is currently installing an IBM 370 system and the Data Base Analyst will be responsible for the designs, modifications, structures and controls of the data base.

Requirements include a B.S. degree with 5 years DP experience with at least 2 years in data base design, control and management. Experience with DL-1 essential.

The exceptional benefits include furnished housing, free transportation, 30-day annual paid vacation, and bonus pay. Starting salary is approximately \$41,300 annually (tax exemption for those who qualify) and a 24-month contract commitment.

If you are interested in learning more about this exciting foreign assignment, please call our toll free number 800-251-2561 or send your resume to:

Linda Hogan
Sr. International Representative
HCA - International Division
P.O. Box 550
Nashville, TN 37202

HCA International Division

An Equal Opportunity Employer



PROJECT LEADERS - and - PROGRAMMERS/ ANALYSTS

AUXCO, a prestigious and progressive software proprietor and consulting organization, specializing in the telephone communications industry, currently has several immediate opportunities for "professionals" possessing the following background:

• **Project Leaders**
Candidates must possess solid leadership experience with technical background in COBOL IMS or PL/I IMS.

• **CICS**
Programmer/Analysts
Individuals must possess 2-5 years' experience programming on-line systems.

• **IMS DB/DC**
Solid working experience designing DB/DC based systems. Candidates should be familiar with COBOL and/or PL/I in an IMS Database environment.

• **Programmer/Analyst**
Experience with "C", UNIX and/or FOCUS database a must.

We offer selected applicants competitive starting salaries and comprehensive benefits. For consideration, send resume stating salary history and requirements to:

JAN ACKERMAN
AUXCO

Auxton Computer Enterprises, Inc.
231 East Pine St., Suite 210
Orlando, Florida 32801
an equal opportunity employer
UNIX is a trademark of Bell Laboratories

DIRECTOR OF COMPUTER SERVICES AND MANAGEMENT INFORMATION SYSTEMS

Morris College is seeking a Director of Computer Services and Management Information Systems. Applicants should possess a Bachelor's Degree (Master's preferred) in information management, and significant administrative experience in an academic environment. Competence in management, programming, systems design and analysis and interpersonal skills is required. The position reports to the Director of Research, Planning and Governmental Relations. The responsibilities of the position include:

1. Management of all college computer services.
2. Participation in the development and implementation of an integrated College Management Information System.
3. Delivery of technical support to the College's instructional programs, including assistance in the development of a CAI/CM program.

For consideration, send letter of application and resume, including salary requirements, before March 15th to:

Julia E. Walls
Director of Research, Planning
and Governmental Relations
Morris College
Sumter, South Carolina 29180

CHAIRPERSON, DEPARTMENT OF MATHEMATICAL SCIENCES MEMPHIS STATE UNIVERSITY

Applications and nominations are invited for the position of Chairperson of the Department of Mathematical Sciences, which houses the disciplines of Mathematics, Statistics, and Computer Science.

The Chairperson is the chief administrative officer of the Department and has responsibility for all aspects of the Department's work. The candidate should have an earned Ph.D. in one of the mathematical sciences, a distinguished record of research, and a commitment to excellence in teaching. The applicant should have an interest in and knowledge of administrative work and should give evidence of the skills needed to be an effective administrator.

The 27 member department maintains an active research program and currently has 254 students. During the past two years, 110 degrees were awarded from B.S. through Ph.D. Applications and resumes, including three letters of reference and two recent reprints should be sent by April 15, 1983 to:

Dr. Cecil C. Rousseau, Department of Mathematical Sciences, Memphis State University, Memphis, Tennessee 38152.

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COMPUTER FIELD ENGINEERS

Manufacturer of an exciting new hardware/software product is seeking experienced field engineers for location in several metropolitan areas including Los Angeles, San Francisco, NYC, Dallas, Cincinnati, St. Louis, etc. Salaries are highly competitive with benefits that include family medical and dental insurance. If you are seeking a future with an aggressive, fast-growing company, send resume to:

Mgr., Field Engineering
Teradata Corporation
120 S. Glasgow St.
Inglewood, CA 90301

PROJECT MANAGER

St. Agnes Hospital is expanding its computer information system and is seeking an experienced individual who can assume project control and technical direction responsibility for a staff of 6 programmer/analysts.

On-line healthcare and financial applications are being developed using a combination of the IBM Patient Care System and specialized packages from other vendors. Computer environment is IBM 4341 DOS/VSE-VM/CMS using CICS and DL/1.

This position offers highly competitive salary and excellent benefits. Our setting overlooking the city of Baltimore offers easy access to the Baltimore - Washington, DC metropolitan area.

For further information call or write:

ST. AGNES HOSPITAL

900 Caton Ave
Baltimore, Maryland 21229
(301)368-6352

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At CompuTool Corporation, talents of our staff of sales professionals is a key to our success. If you are lured by the potential of a rapidly growing market we want to talk to you.

CompuTool is a growth-oriented company developing and cultivating a strong niche market. CompuTool interactive 3/D CAD/CAM systems address manufacturing productivity needs through the applications of state-of-the-art technology. To enhance your ability to succeed, CompuTool has developed a strong team-oriented sales and marketing environment to capitalize on the opportunities of the CAD/CAM market.

If you are a sales professional with at least two years CAD/CAM and/or related system sales experience, this is an opportunity for you. Opportunities exist nationwide. As a leader, we provide excellent benefits, a highly competitive compensation program and potential for management growth.

For prompt consideration, please forward your resume and salary history/requirements, in confidence to:

HERMAN A. RUBIN
DIRECTOR OF SALES
COMPUTOOL CORPORATION
5600 Lincoln Drive
Minneapolis, MN 55436

BENCHMARK CONSULTANT

Manufacturer of large-scale computers is seeking a benchmark consultant to support field marketing personnel and software systems used by CYBER 200 benchmark labs. Position also includes research of operating software facilities to support use of vector processing and virtual memory techniques.

Masters degree and a minimum of five years of experience with large, scientific computers including the CYBER 205, 170, 6000 series systems are required. Knowledge of optimization techniques for vector processing and of high performance, intermainframe local networking techniques is needed.

Experience in a marketing support environment including technical presentations and reports is also required. Job involves 10% travel and flexible working schedule with evening and weekend hours. Salary level is \$3850.00/month.

Interested applicants should forward their resume to:

Nancy Thompson/MDES 3-17
309 Second Ave. South
Minneapolis, MN 55401

An Affirmative Action Employer

Management Information Services

Due to expansion, one of the Southwest's leading medical centers is currently seeking qualified applicants for the following positions:

- **LEAD PROGRAMMER/ANALYST**
Minimum five years experience
- **SENIOR PROGRAMMER/ANALYST**
Minimum three years experience
- **COMPUTER PROGRAMMER**
Minimum one year experience

Candidates should have knowledge in VRX operating system, V6885MP utilizing VRX COBOL and CAM file structures.

These positions offer an excellent benefit package. Compensation commensurate with experience. Interested candidates meeting qualifications should send resume to:

Providence Memorial Hospital
Personnel Department
2001 North Oregon
El Paso, TX 79902
EOE

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Find the job you want in Computerworld's classifieds. No other publication carries as many ads for computer professionals as Computerworld, so no other publication can give you as wide a choice of jobs, salary and location as Computerworld. You can even try a "Position Wanted" ad to look for exactly what you want, where you want.

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We set aggressive goals and drive ourselves hard to achieve them. We recognize that this is a unique time, when our products will change the way people work and live. It's an adventure, and we're on it together!

Apple's expanding nationwide sales organization offers these challenging career opportunities throughout the United States:

Account Executives

Call on Fortune 1500 National Accounts, OEM customers or educational institutions. Minimum 4 years major account sales experience in the computer industry required. Also seeking experienced sales managers.

Sales Support Analysts

Provide direct support to field sales personnel, assist with sales development, make sales calls, identify and solve technical problems. Requires advanced knowledge of DP technology and applications, programming methods and system design, and a working knowledge of data communications and system architecture. Minimum 3 years similar experience with a major computer vendor required.

OEM Sales Program Manager

Based in Cupertino, CA

Drive sales programs on a team basis, working with RSM's, OEM salespersons, and Rep firms. Handle leadership role in some contract negotiations. Introduce and integrate new sales programs. 5-8 years OEM sales and sales management experience in the computer industry. BSEE/CS or equivalent. MBA preferred.

Join our adventure now! Send your resume to E. Curran, Apple Computer Inc., MS 16-B, Dept. CW, 20525 Mariani Avenue, Cupertino, California 95014.

apple computer inc.
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PRODUCT MANAGER

OXFORD Software, one of the international leaders in IBM-compatible on-line application development software, is seeking a Product Manager to handle one of our newly-created software products.

The individual we seek should have a working knowledge of IBM mainframe computers, CICS, and COBOL. Prior experience in the areas of administration, marketing and customer support within the software industry desirable.

OXFORD Software offers excellent growth potential, a professional working environment, intellectual challenge and one of the most extensive and innovative employee benefits packages offered in the industry.

If you feel that you meet the above qualifications, please submit resume and salary requirements to: Personnel Manager.



OXFORD SOFTWARE CORPORATION
174 BOULEVARD/HASBROUCK HEIGHTS, NJ 07604

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USA TODAY

ANALYSTS/PROGRAMMERS PROJECT LEADERS FIELD SUPPORT

USA TODAY, the nation's newspaper, has career opportunities for computer professionals interested in the start-up of a large IBM 4300 mainframe operation and a nationwide distributed DATAPoint network.

IBM 4300 SYSTEMS
Candidates must have solid experience on IBM mainframe and a proven track record in developing interactive MIS applications. Experience with VM, CMS, COBOL, and RACF is strongly preferred. Experience in managing project groups a strong plus.

DATAPoint SYSTEMS
Analyst/Programmer: Requires solid experience in DATAPoint systems utilizing DATABUS. FIELD SUPPORT COORDINATORS: Support distributed nationwide network. Requires entry level experience in DATABUS. Some travel involved.
General responsibilities include: (1) Identification of business related problems and new applications for users, (2) recommending system and procedural solutions, (3) selling the solutions, and (4) follow-up design, development, and implementation. A degree in a business or computer related field is required.

Location of positions is in the nation's capital, WASHINGTON, D.C. Salary is commensurate with experience. We offer top company benefits. Interested applicants should apply by submitting a resume and cover letter stating salary requirements to:

USA TODAY
Personnel Department
P.O. Box 500
Washington, D.C. 20044
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Systems Software, Hardware and Applications Professionals. . .

Focus On Your Future With Tektronix

In a pleasant suburb of Portland, Oregon, we are gathering a group of technical professionals who will develop a new generation of products for Engineering Computing Systems. This can be your chance to combine the visibility and excitement of a new business start-up with the resources of an established leader in advanced electronics. Each of the items listed under the categories below represents an excellent opportunity for technical achievement and professional advancement.

HARDWARE/ SOFTWARE ENGINEERS

- High performance Computer System architecture design.
- Develop firmware for Ethernet controller.
- Advanced bit slice, bit mapped display systems design.
- Microcode and microcode tools development.
- Design of diagnostics and quality assurance features.
- Develop and evaluate user interface peripherals.
- Development of instrument bus interfaces and co-processing boards.
- Development of large disk interface.
- Selection and interface of peripheral devices.

TECHNICAL WRITERS

- Write service manuals for engineering computing systems and manuals to describe user interface.

MARKETING MANAGEMENT

- **Marketing Manager**
Develop and manage start-up marketing organization.
- **Product Marketing Manager**
Direct the development of marketing strategies for computing system products.

SOFTWARE ENGINEERS

- Develop and integrate advanced Local Area Networking features into UNIX™ kernel.

- Design and develop remote peripheral interfaces and remote file access over LAN.
- Adapt and modify UNIX™ kernel for a microprocessor based system.
- Implement a Basic interpreter/compiler.
- Development of advanced display systems software.
- Develop and integrate an advanced data base management system into a UNIX™ environment.
- Development of real time enhancements for a UNIX™ operating system.
- Develop and maintain test tools for design verification.
- Evaluate, select and implement operating systems and language packages.

TECHNICAL MANAGEMENT

- **Manager, Local Area Networking**
Lead the Software/Hardware development of local area networking subsystems.
- **Manager, Data Base Systems**
Plan, organize, lead and control data base management software group.
- **Manager, Application Software**
Identify, assess and implement a set of general purpose engineering software applications within engineering computing environment.
- **Manager, Advanced Display System and User Interface Development**
Plan, organize and develop advanced bit mapped display systems.

All openings require a technical degree and relevant experience. We can offer compensation that will reflect your education and experience. Subsequent advancement will be based on individual achievement. Benefits include profit sharing and relocation assistance to Portland, a livable city with a mild, four season climate, abundant recreation and a surprisingly affordable cost of living.

For confidential consideration, please send your resume to Professional Staffing, Engineering Computing Systems, P.O. Box 1000, MS 63-658, Wilsonville, Oregon 97070, or call (collect) (503) 685-2524.

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Tektronix
COMMITTED TO EXCELLENCE

Programmer/Analyst (Chicago)

Our manufacturing division has an immediate need for professional programmer/analyst to assist in program design, programming, testing and system installation. Qualifications include COBOL, CICS, DL-1 or IMS (1 year minimum), and experience in one or more applications: bill of material, MRP, purchasing, inventory control or cost control.

We offer an excellent salary/benefits and opportunity for personal growth. For a confidential interview, call or send resume to:

Ramsey Spoon

informatics
General Corporation

9441 LBJ Freeway
Dallas, Texas 75243
214/231-1400

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Microcomputer Systems Programmer

American Dade has an immediate opening for a Microcomputer Systems Programmer to assist in the support of Clinical Laboratory Microcomputer product lines. The ideal candidate will have extensive experience with Microcomputer hardware and software emphasizing Apple and IBM products using C/P M Basic. Excellent communications skills will be needed to interface with vendors and with all levels within the division in order to translate Marketing needs into Data Processing Systems.

American Dade employees enjoy an excellent compensation system and a comprehensive benefit package. In addition, our leadership position in the dynamic health care industry will provide many opportunities for personal and professional growth and development. For confidential consideration please forward your resume and salary history to Ray Angele, Personnel Manager.

American Dade

Division of
American Hospital Supply Corporation
P.O. Box 50872
Miami FL USA 33152

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First National Bank In Albuquerque

First National Bank In Albuquerque, the largest independent bank in New Mexico, is in the process of building the best and most up to date processing department in the state. We have recently installed dual IBM 4341's running under VM, DOS/VSE to support a large on-line network, including teller terminals, administrative terminals and 24 hour APM's. All applications are in the process of being updated and most are being changed for on-line access and MVS operating systems.

EDP AUDITOR

We currently have an excellent opportunity available for an EDP Auditor. Qualified applicants will possess the following background: BS in business with accounting minor, or BS in business with 1 year accounting experience. 2 to 5 years banking auditing experience, or 2-5 years financial applications programming/analyst/project leader experience with a working knowledge of systems development methodology required. A knowledge of IBM 370 environment under DOS/VSE necessary; knowledge of Easytrieve, COBOL and Assembler highly desirable. General banking knowledge and an ability to communicate clearly in oral and written form are essential.

SR. SYSTEMS PROGRAMMER

The Sr. Systems Programmer should have MBS Systems Programming experience and MVS systems programming experience.

PROGRAMMER ANALYST

The Programmer Analyst should have 3-5 years experience in Assembler, knowledge of MVS and COBOL helpful. Exposure to banking applications preferred.

First National Bank In Albuquerque offers an excellent compensation and benefits package. Qualified applicants may submit their confidential resume and salary history to:

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In Albuquerque**
New Mexico's Largest
Home-Owned Independent Bank
Member FDIC

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The First National Bank
In Albuquerque
P.O. Box 1305
Albuquerque, NM 87103
Equal Opportunity
Employer M/F/V/H

ACADEMIC COMPUTING

Cobby College invites applicants for the position of Coordinator of Academic Computing. The successful applicant will be responsible for providing technical support and assistance to faculty members in seeking, obtaining, installing, and documenting software and datasets which are appropriate for integration into existing courses. In addition, the Coordinator of Academic Computing will offer workshops or seminars on the use of the various computing facilities at Cobby College and tutorials to students and faculty on introductory concepts required for specific uses of the computer. This individual will report to the Director of the Cobby College Computer Center and will have faculty status. Applicants should have considerable experience with user support in an academic setting, a wide knowledge of datasets and software available for academic use, and detailed familiarity with UNIX and several programming languages including PASCAL and FORTRAN, and preferably C and BASIC. It is hoped that the Coordinator of Academic Computing will have experience and continued interest in research and teaching in one of the traditional academic disciplines. Applications, including at least three letters of recommendation, should be sent to:

Professor L. Sandy Maisel, Chair
Academic Computing
Search Committee
Cobby College
Waterville, Maine, 04901
before March 31, 1983
AFFIRMATIVE ACTION
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Assistant Director Academic Computing

San Francisco Community
College District
Application Deadline,
Wednesday, March 16, 1983
Salary Range, \$35,688 - \$39,156

Plans, organizes, supervises, evaluates, and assists with budgeting and instructional development for all academic computing services and operations.

Qualifications include an earned master's degree or higher with significant emphasis on computer-related training, and three years of full-time experience working in academic computing.

For detailed qualifications and application information, please contact:

Reginald Y. Alexander
Vice Chancellor, Certificated Services
San Francisco Community College District
33 Gough Street
San Francisco, California 94103

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NEW START-UP OPPORTUNITIES

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Kansas City, KS 66106
(913) 631-3270

Programmer/Analyst: Development of computer systems for aircraft and missile guidance simulators. Expertise in computer languages, compilers, and graphics required. Expertise in two- and three-dimensional graphic displays and graphic algorithms required. M. Sc in computer science required. \$24,600 per year. Contact Provo Job Service Office, 1550 North 200 West, P.O. Box 1339, Provo, Utah 84603: 801-373-7500 and request job order number 63413.

DATA PROCESSING

SYSTEMS PROGRAMMER

The Information management department located in Columbia, South Carolina, has an immediate need for a Systems Programmer in a teleprocessing environment. We are a well established multi-million dollar agricultural, financial institution serving 4 states.

We're seeking a qualified Systems Programmer who is interested in a professional environment which encourages personal responsibility with minimum supervision. Qualified applicants will enjoy a challenging atmosphere where advancement is based on results.

Successful candidate must have 2 years experience in Systems Programming with background in DOS/VSE, CICS, ALC, BTAM. Primarily responsible for CICS and other Data Communications Software. Secondly responsible for Total Data Base and Data Base Administration.

We offer a competitive salary commensurate with experience, relocations assistance, and an extensive benefit package. For immediate consideration, please forward your resume and salary history in complete confidence to:

FARM CREDIT BANKS
P.O. BOX 1499
COLUMBIA, S.C. 29202



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(No Agencies Please)

ON-LINE

Tres Systems is looking for several very competent people who have a minimum of 3 years experience in either one of these two disciplines:

IMS/db-dc (dc a must)

or

CICS (Command).

All positions offer travel opportunities (one IMS assignment is in Los Angeles). Preferred IMS experience should include PSB and DBD gens (or similar DBA type functions). Preferred CICS experience should include some grasp of internals such as table gens.

Tres offers a better than average salary, relocation and an excellent benefits package. To investigate this challenging opportunity to work among top flight professionals, call or send resume to:

Hans Nintzel
(214) 248-TRES
TRES SYSTEMS, INC.
16775 Addison Road
Dallas, Texas 75248

Equal Opportunity
Employer, m/f/v/h

MVS SYSTEMS PROGRAMMER

Cedars-Sinai Medical Center, the West's premiere medical center, seeks an experienced MVS Systems Programmer with in-depth knowledge of MVS/SP, JES2, CICS, ACF/TAM/NCP, SMP4 and RACF. Must be capable of installation, tuning, and maintenance of MVS/SP and system components. Experience with operating system conversions and capacity analysis a definite plus. Salary is in the low to mid 40's, and supported by a superior benefits package including three weeks vacation the first year. Submit resume to:

Mr. John Gilbert, Employment

C S H C

8723 Alden Dr.

Los Angeles, Calif. 90048

(213) 855-5529

FACULTY POSITION IN BUSINESS DATA PROCESSING

The Computer Information Systems Department welcomes applications for a faculty position available September 6, 1983. A Bachelor's degree required, Masters preferred. Minimum of three years business data processing experience required. Requires strong interest in undergraduate instruction and ability to teach courses in several of the following areas: Systems Analysis, Programming Languages, Teleprocessing and Data Base Management.

Send a complete resume to Dr. Stuart J. Travis, Head, Department of Computer Information Systems, Ferris State College, Big Rapids, MI 49307.

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EQUAL OPPORTUNITY EMPLOYER.

CAREER OPPORTUNITIES FOR SOFTWARE PROFESSIONALS

COME GROW WITH GAI

GALLER ASSOCIATES, INC. (GAI), is a twelve year old international consulting and software development firm. We are seeking career-minded ADP professionals with 2 or more years experience to join our talented technical staff. GAI offers challenging technical assignments and career growth opportunities; excellent salaries and fringe benefits; and we pay relocation costs too! We have openings in Arizona, California, Texas, New York state, and the Washington D.C. metropolitan area and in Virginia for individuals with the following experience:

SYSTEMS PROGRAMMERS

- IBM 370, 30XX, 4341: solid background in internals of OS/MFT and OS/MVS. ALC skills essential and FORTRAN expertise very helpful.
- HONEYWELL 6000, 66, DPS-8: proven record in the internals of GCOS-III and/or GCOS-8, GMAP; also, GRTS-II internals and 355MAP.

APPLICATIONS PROGRAMMERS

- IBM 370, 30XX, 4341: COBOL programmer/analysts with experience in one or more of the following—CMS, TSO/ISPF, ADF, VSAM, Data Base Management Systems (IMS, M204, TOTAL).
- HONEYWELL 6000, 66, DPS-8: COBOL programmer/analysts with experience in one or more of the following—DM-IV/TP, IDS-III, TSS, TPE, TDS.
- VAX 11/780 and 4-PHASE: programmer/analysts with UNIX operating system experience, VISION and/or FOREWORD.
- TANDEM: programmer/analysts with GUARDIAN operating system experience, ENVOY and/or TAL.

If you have the skills and the desire to join a solid, growing company, call now, or send your resume & salary history to:

GALLER ASSOCIATES, INC.
1000 Wilson Blvd., Ste. 2105
Arlington, Virginia 22209
(703) 525-9292

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HIRING?

More than half a million computer people read Computerworld every week. And, among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads). No wonder Computerworld carries more recruitment ads for computer people than any other publication. To place your ad or to get a rate card with complete details on Computerworld Classifieds, call or write:

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Framingham, MA 01701
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GROWTH OPPORTUNITY

CACI is a major software systems development and technical services firm, known throughout the industry for providing innovative, high technology and performance-oriented products and services. We have immediate openings for ambitious, motivated individuals desiring career growth opportunities marketing these technical services and developing new software products for the Honeywell User Community.

- **Software Products Marketing Specialist**
Position responsible for marketing recently announced CACI software development products. Requires three to five years' experience in software product marketing, including market identification, product introduction, and market expansion. Proven sales track record, technical expertise and customer interface skills required.
- **Software Services Marketing Manager**
Five or more years' experience in building, managing and growing technical services business lines with government and private industry. Service areas include data base requirements analysis, user training, data base conversion assistance, application systems development, and client technical support.

Forward resume with employment experience and salary history to: (no agents)

Dave Wilson, Manager
Advanced System Department

C.A.C.I.

CACI, Inc. — Federal
5010 Trindle Road
Mechanicsburg, PA 17055

EOE M/F/V/H

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position announcements	position announcements	position announcements	position announcements	position announcements
<p>SEED SOFTWARE, a dynamic growing division of United Information Services, Inc., is searching for three exceptional people to participate in the development of a state-of-the-art data base management system. All positions are located in Philadelphia.</p>	<p>SENIOR SOFTWARE ENGINEER</p>	<p>Requirements:</p> <ul style="list-style-type: none"> • Minimum three years IBM Assembler language programming in OS, VS, or MVS environment; systems programming experience preferred. • Access method programming at the macro level. • TSO, VM and telecommunications experience preferred. • M.S. in Computer Science highly desirable. 	<p>ENDOWED PROFESSORSHIP IN INFORMATION/COMPUTER SCIENCE</p>	<p>MANAGEMENT SYSTEMS ANALYST</p>
<p>SOFTWARE ENGINEERS</p>	<p>Requirements:</p> <ul style="list-style-type: none"> • Two years FORTRAN experience. • Minimum of one year experience with PRIME, Perkin-Elmer or PDP-11. • Assembler language experience on mini-computer preferred. 	<p>All positions require a Bachelors degree in Computer Science or a related field; equivalent experience with systems architecture or data base management systems will be considered.</p>	<p>THE PENNSYLVANIA STATE UNIVERSITY</p>	<p>Salary to: \$30,000 - negotiable and commensurate with experience and training. In addition, an excellent employee benefits package is offered. ANALYSIS AND DESIGN WORK RELATED TO DATA FLOW AND MANAGEMENT INFORMATION SYSTEMS FOR THE FIRE AND POLICE DEPARTMENTS OF THE MUNICIPALITY OF LITTLE ROCK, ARKANSAS.</p>
<p>We offer an excellent salary plus a comprehensive company-paid benefits package. For consideration, send resume including salary history to:</p>	<p>R.J. Pearce, Employment Manager</p>	<p>UNITED INFORMATION SERVICES, INC.</p>	<p>Continuing faculty positions in computer science at a number of The Pennsylvania State University's branch (2-year) campuses beginning August 22, 1983. Candidates should be genuinely interested in teaching lower-division baccalaureate and service courses, COBOL-oriented courses add considerable spice to the teaching diets at several of these campuses at which an associate degree is offered. M.S. in computer science is required; completion (or near completion) of Ph.D. is highly desirable; demonstrated desire for continued scholarly growth and research. Please indicate specifically if interested in an assignment involving associate degree program. A letter of application with resume and names of three people who may be contacted as references should be sent to Dr. Fred L. Blevy, Computer Science Department, Box 202A, Whitmore Lab, University Park, PA 16802. Deadline is March 31, 1983. AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.</p>	<p>Submit resume to: City of Little Rock Department of Personnel 522 West Markham Little Rock, AR 72201 Phone inquiries: Ronald G. Lloyd-Director of Personnel 501-371-4577 AN EQUAL OPPORTUNITY EMPLOYER</p>
<p>UNITED TELECOM COMPUTER GROUP ONE ALLEGHENY SQUARE, SUITE 720, PITTSBURGH, PA 15212</p>	<p>An Equal Opportunity Employer</p>	<p>SOFTWARE ENGINEERS</p>	<p>ASSISTANT PROFESSOR DATA PROCESSING</p>	<p>FLORIDA</p>
<p>Supervisor, Systems Engineering & Software</p>	<p>Requirements: BS/MS Computer Science or Engineering; 5-7 years' experience in computer-based analysis and programming tasks in scientific and real-time areas. Supervisory and/or program development Software Technology experience desirable.</p>	<p>Responsibility: Development of artificial intelligent/expert software systems as well as encouraging the technical growth and professional development of the programmers and analysts in the R&D Computer Applications group.</p>	<p>Master's in Mathematics, Data Processing or related area strongly preferred. Strong background in at least 3 high level languages and in Assembler (IBM or VAX) required. Teaching experience, familiarity with display graphics and numerical analysis desired. Salary commensurate with teaching experience and ability, up to \$24,000.</p>	<p>Our clients require your experience on IBM hardware now! Hands on experience of IMS, CICS, IDMS, PL/I, VSAM, FOCUS or COBOL a plus. All fees and relocation expenses assumed by our clients. Immediate interviews and offers! Call or send confidential resume including salary requirement to:</p>
<p>Software Engineer</p>	<p>Requirements: BS Computer Science, Physics, or Engineering; 3+ years' industrial experience in systems level design and integration of real-time software.</p>	<p>Responsibility: Assist in generating the software system design, development plan and configuration management scheme, as well as specifying and describing the computer software operating configuration, programs and communication.</p>	<p>This is a 10-month, tenure track position. Excellent benefits including tuition remission for dependents. Reply by March 25, 1983 to: Mark Turner, Asst. Dean University College, ML 47 Cincinnati, Ohio 45221 An Affirmative Action/Equal Opportunity Employer</p>	<p>Mr. Wils Bell, KTA, 5151 Adanson St., Ste. 104, Orlando, FL 32804, (305) 628-2633.</p>
<p>MTI is a high technology corporation offering competitive salary, benefits, and a creative work environment. Our Capital District location provides easy access to major metropolitan areas, a high quality of living and reasonable costs.</p>	<p>Qualified individuals interested in becoming integrally involved in state-of-the-art electronics should forward resume in complete confidence to Ms. Vicki Smith.</p>	<p>MECHANICAL TECHNOLOGY INC. 968 Albany-Shaker Rd. • Latham, NY 12110 An equal opportunity employer M/F/H</p>	<p>UNIVERSITY OF CINCINNATI Cincinnati, Ohio 45221 An Affirmative Action/Equal Opportunity Employer</p>	<p>SOCIAL SCIENCE APPLICATIONS PROGRAMMER</p>
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<p>COMPUTER TECHNOLOGY INSTRUCTOR</p>	<p>Qualifications: Bachelor's degree in Computer Science or in related field and a minimum of 2 yrs. work exp. in D.P. required. Master's degree in Computer Science with business orientation, knowledge of COBOL, VSAM & Data Base preferred.</p>	<p>Duties: Instruct courses such as Intro to C.T., Computer Operations, Micro Computers, BASIC, FORTRAN, COBOL, etc.</p>	<p>A database publishing subsidiary of a major corporation maintains a database of computer equipment installations. We need someone who is familiar with most of the major computer families (by make and model) currently on the market. With this information you will work with computer printouts or at a terminal to review output for the database, and assign appropriate codes. You should have good analytic skills and the ability to apply yourself to detail work for extended periods of time. Access to industry reference material is provided. Very flexible hours. Seasonal work load. Paid on an hourly basis.</p>	<p>Debbie Groberg Resources for the Future 1755 Massachusetts Ave. Northwest Washington, D.C. 20036 EOE M/F Principals Only</p>
<p>Starting date: August 15, 1983</p>	<p>Forward resume to Office of Personnel Services, McLennan Community College, 1400 College Dr., Waco, TX 76708.</p>	<p>An Equal Opportunity/Affirmative Action Employer</p>	<p>FIELD ENGINEERS</p> <p>Hartford Technical Services is seeking Senior Level 303X, 370, and 4300 X-IBM FE's with openings in Chicago, L.A., Houston, Detroit and Ohio. H.T.S. is a maintenance company that offers substantial savings and service to its maintenance customers. Salary and benefits commensurate with your expertise. If you are seeking a future and have these skills call:</p>	<p>EOE M/F Principals Only</p>
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<p>An Equal Opportunity/Affirmative Action Employer</p>	<p>An Equal Opportunity/Affirmative Action Employer</p>	<p>An Equal Opportunity/Affirmative Action Employer</p>	<p>Affirmative Action/Equal Opportunity Employer</p>	<p>Our mailing address is COMPUTERWORLD, Classified Advertising, 375 Cochituate Road, Box 880, Framingham, MA 01701.</p>
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Assistant Director
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 Division of University Computing
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Candidates should be competent in PASCAL and FORTRAN, and should be willing and able eventually to teach other languages such as assembly or BASIC as needs arise. Candidates with teaching experience are preferred, but others such as recent graduates or those with meaningful job-related experience in computing are welcome to apply.

Hardware support at UPJ is given by the university's computer center in Pittsburgh with a DECsystem-10 in both timesharing and RJE environments. Several micros, display graphics equipment (high resolution video and hard copy), and a PDP-11 are also available for coursework, projects and faculty research.

Application materials should include a vitae and supporting documents and should be submitted by March 1, 1983, to Dr. K.D. Callahan, Department of Computer Sciences, University of Pittsburgh at Johnstown, Johnstown PA 15804. UPJ is an Equal Opportunity/Affirmative Action Employer.

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These highly visible, key positions, are available for experienced individuals interested in working on 8- & 16-bit microcomputer-based technology. You'll have the opportunity to be involved on a new product with state-of-the-art systems and communications software. You will need device driver experience plus a working knowledge of assembly language programming, with knowledge of 'C' language a plus. A proven background in data communications is also necessary. Please respond to Terry Hill.

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National Semiconductor

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New position with Johnson Controls, Inc. reporting to the Manager of Corporate Data Resource Management, with responsibility for developing an operational data administration function: including strategic data base planning, data analysis and design and normalized data structure development within dictionary based environment.

Our operating system is an OS/MVS 3033, IDMS environment serving Corporate and multi-division data needs. We seek a degreed person (or equivalent) with at least 6 years EDP experience of which at least 3 have been in data administration. Must have strong communication skills in user and user management contacts. Manufacturing and financial systems experience desirable.

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Systems Support Manager



Ft. Lauderdale, Florida

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The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

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We also provide telecopier service at extensions 410 and 451.

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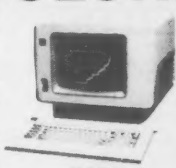
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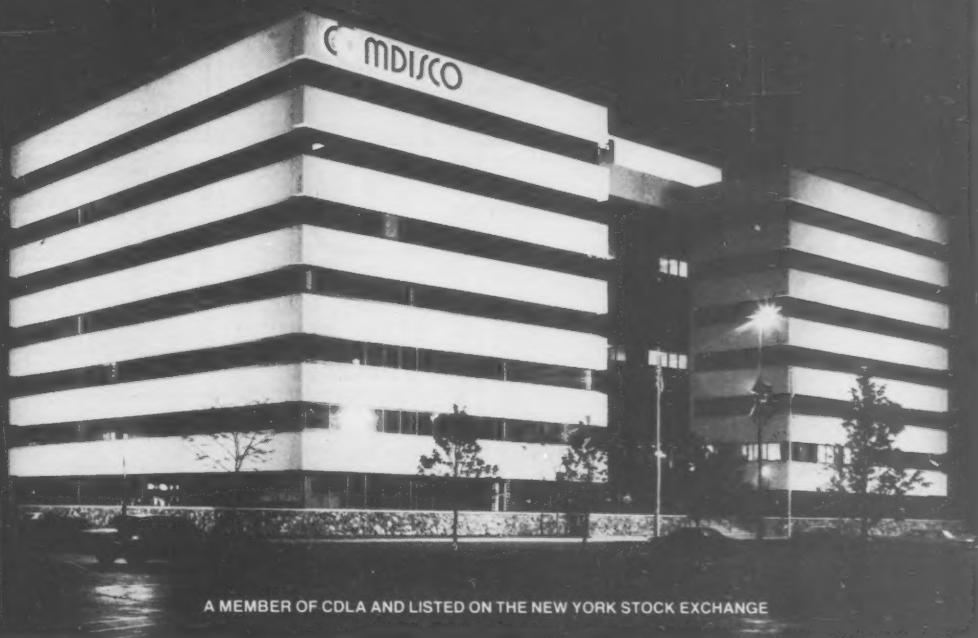
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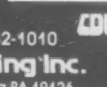
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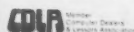
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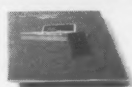
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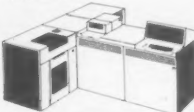
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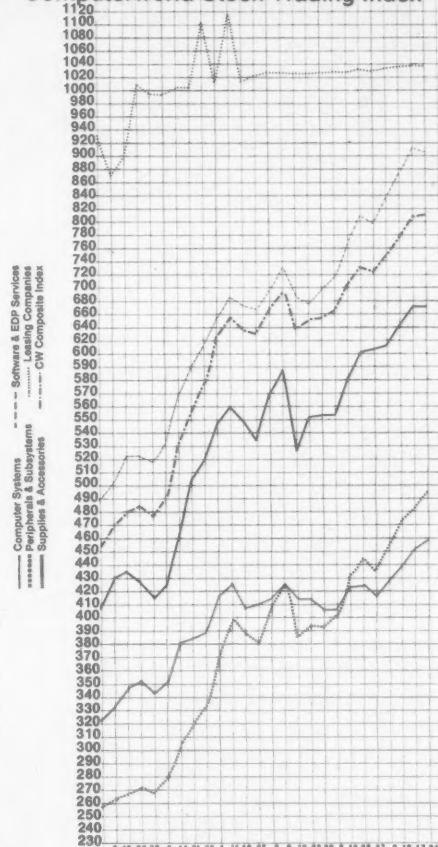
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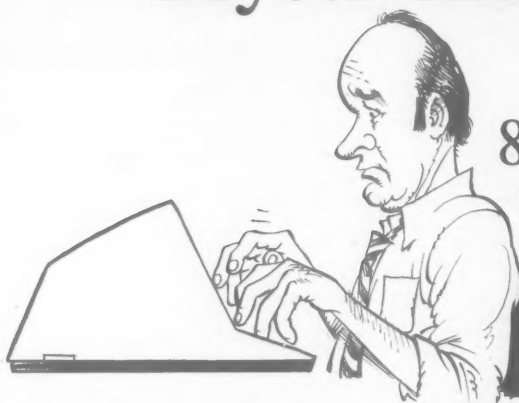
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PRICE							PRICE							PRICE						
1982-83		CLOSE	WEEK	WEEK	1982-83		CLOSE	WEEK	WEEK	1982-83		CLOSE	WEEK	WEEK						
RANGE	FEB 22	NET	PCT		RANGE	FEB 22	NET	PCT		RANGE	FEB 22	NET	PCT							
(1)	1983	CHNGE			(1)	1983	CHNGE			(1)	1983	CHNGE								
COMPUTER SYSTEMS																				
A ANDAHL CORP	17-44	40		-5/8	-1.5	O ADVANCED CORP TECH	1-4	4 3/4	-1/4	-6.2	A COMPUTER CONSOLES	15-44	40 1/2	+5/8	+1.5					
N BARRONDS CORP	28-49	47		-1 1/2	-3.0	O ADVANCED SYSTEMS INC	8-24	23 3/4	+1/2	+2.1	O COMPUTER DEVICES INC	4-21	14 1/4	-3/8	-2.5					
O COMPUTER AUTOMATION	7-17	14 3/8		-1 5/8	-10.1	O AGS COMPUTERS INC	7-22	18 1/4	-1/4	-1.2	O COMPUTER TRANSLUCER	7-24	7 7/8	-1/4	-1.8					
N CONTROL DATA CORP	21-48	47 1/4		-1/4	-0.5	N ANACOMP INC	8-22	20 1/2	-1/4	-1.2	N COMPUTERVISION CORP	19-45	42 3/8	-1/2	-1.1					
N CRAY RESEARCH INC	20-48	44 3/8		-2 3/8	-5.0	O ANALYSTS INTL CORP	5-8	8 3/4	0	0.0	N CONPARC CORP	21-36	34 3/4	-1 1/4	-3.4					
N DATA GENERAL CORP	20-35	34 3/4		+7/8	+1.8	O APPLIED DATA RES.	16-45	42 1/4	-1/4	-0.5	O DATA ACCESS SYSTEMS	16-41	39 1/8	-1/4	-0.8					
N DATAPoint CORP	11-36	24		+1/2	+2.1	O ASK COMPUTER SYSTEMS	12-35	32 1/2	-1 5/8	-4.7	A DATAPRODUCTS CORP	5-12	11 1/4	+5/8	+5.8					
N DIGITAL EQUIPMENT	82-129	124 1/2		+3/4	+0.6	B ASTRODYNE CORP IND	1-5	4 5/8	+7/8	+23.3	O DATUM INC	2-10	8 3/4	-2 1/4	-1.1					
A EECO INC	6-12	11 5/8		+1/4	+2.1	O AUTOMATIC DATA PROC	21-38	35 3/4	-1/4	-0.6	O DAVID JAMISON CARLYL	5-7	7 1/4	0	0.0					
N ELECTRONIC ASSOC.	3-12	9 5/8		-3/8	-3.7	O COA COMPUTER ASSOC	5-14	12 1/2	0	0.0	O DECISION DATA CORP	3-14	13 1/4	-1/2	-3.6					
N FLOATING POINT SYST	18-25	34 5/8		+1/8	-3.2	O COMPUTER ASSOC INT'L	12-45	45 1/4	+1/4	+0.5	N ELECTRONIC M & M	5-8	8 1/4	+1 3/8	+20.8					
N FOURDRY	22-42	41 3/8		-1/2	-1.1	O COMPUTER HORIZONS	2-12	11 3/4	+1/8	+1.0	O EVANS & SUTHERLAND	18-50	44 1/2	-2 3/4	-5.8					
N FULCRUM CORP GRP	1-3	1/4		0	0.0	O COMPUTER NETWORK	4-10	9 1/4	-1/8	-1.3	O GANDALF TECHNOLOGIES	19-22	15 3/4	-3/8	-2.3					
O GENERAL AUTOMATION	3-8	6 7/8		0	0.0	N COMPUTER SCIENCES	11-23	20 3/4	-3/4	-3.4	N GEN'L DATA COMM IND	6-19	17 3/4	+1 1/4	+7.5					
N HARRIS CORP	20-30	48 7/8		+2 1/8	+4.4	O COMPUTER TASK GROUP	8-18	18	-1	-5.8	O GENERAL TERMINAL CP	0-2	5/8	0	0.0					
N HEMLETT-PACKARD CO	38-87	83 1/4		-1/8	-0.1	O COMPUTER USAGE	2-18	15 1/4	0	0.0	O GREAT SOUTHWEST INC	2-6	2 1/2	0	0.0					
N HONEYWELL INC	60-104	92 3/8		-1 7/8	-1.8	O COMPUTONE SYSTEMS	15-38	33 1/2	-3/4	-10.0	N HAZELTINE CORP	22-56	52 7/8	+1 3/8	+2.6					
N IBM	97-100	97 1/8		-1/4	-1.2	O CONSERV CORP	11-20	17	-2/4	-4.2	O ICDT CORP	3-10	8 5/8	-1/4	-2.8					
O IPL SYSTEMS INC	5-11	10 3/4		+1/4	+26.4	O CONSHARE	6-12	10 5/8	-7/8	-7.6	O INFORMATION INTL INC	10-22	19 3/4	-1/2	-2.4					
O MAGNISON CORP SYST	2-3	3 1/8		+2 1/8	+4.1	N CULTINET SOFTWARE	12-35	30 3/4	-2	-6.1	O INTEL CORP	21-46	44 3/4	+1/4	+0.5					
N MANAGEMENT ASSIST	7-18	17 1/8		+1/4	+1.4	O CYCARE SYSTEMS INC	9-18	15 7/8	0	0.0	N IRL SYSTEMS INC	5-11	10 3/4	+1 1/4	+5.4					
O MINI-COMPUTER SYST	1-2	1/2		0	0.0	O DATA DIMENSIONS INC	1-2	1/4	0	0.0	A LUNDY ELECTRONICS	7-16	15 1/4	+1/8	+0.8					
N MODULAR COMPUTER SYB	8-15	13 3/4		-1/2	-3.5	O DATATAB	0-2	3/4	-1/8	-14.2	A MSI DATA CORP	14-36	22 5/8	+2	+9.6					
N NOKIA DATA SCI	10-19	16 5/8		-3/8	-2.2	O DATATRON CORP	2-4	3 7/8	+3/8	+10.7	O NETWORK SYSTEMS CORP	3-5	4 5/8	0	0.0					
N NCR	39-107	103 1/4		+1 1/4	+1.2	N ELECTRONIC DATA SYST	19-55	53 3/4	-7/8	-1.6	O OXI	3-5	3	0	0.0					
N PERKIN-ELMER	17-33	29 1/4		-3/4	-2.5	N INFORMATICS INC	10-28	27 3/4	+1/2	+1.8	N PARADYNE CORP	24-51	49 3/4	-3/4	-1.4					
N PRIME COMPUTER INC	16-45	42 3/4		-1/2	-3.3	O INSYTE CORP	1-3	2	-1/8	-5.8	A PENSACOLA CORP	1-2	3/4	-1/4	-1.8					
N SPERRY CORP	21-39	35 5/8		-2 7/8	-7.4	O IPS COMPUTER MARKET	1-2	1 1/8	0	0.0	O RAMTR CORP	12-26	24 1/4	-1	-3.8					
O TANDEN COMPUTERS INC	14-28	26		-1/4	-1.2	O KEANE ASSOCIATES	4-8	8	+1/4	+3.2	N RECOGNITION EQUIP	4-13	11 1/4	7/8	-7.2					
N TEXAS INSTRUMENTS	17-176	161		-7 3/8	-4.3	O LOGICON	12-24	31 7/8	-1/8	-2.6	A SCARLETT CORP	1-3	3 3/8	0	0.0					
A WANG LABS "B"	13-37	36 1/2		+1/8	+0.3	O NNMT SCI AMER INC	8-28	25	-1/2	-1.9	N STORAGE TECHNOLOGY	16-33	24	0	0.0					
A WANG LABS "C"	11-37	36 1/8		-1/8	-0.3	O NATIONAL DATA SYST	12-20	21 1/2	+1/2	+3.2	O SYKES DATATRONICS	6-27	14 5/8	-1/8	-0.7					
						O NATIONAL MATHEMATICAL APP GRP	1-2	1/2	+1	+10.2	A T&E INC	7-14	13	-1/8	-1.9					
						O NATIONAL DATA SYST	5-22	21 1/2	+1	+10.2	A TEC INC	6-12	9 1/4	+7/8	+10.4					
						O PARADIGM SYSTEMS	0-25	25	+3/8	+3.4	N TETRONIX INC	34-73	72 1/2	+5/8	+2.2					
						N PLANNING RESEARCH	6-19	14 1/2	-1/4	-1.6	N TELEK	25-51	49 1/8	+1 1/8	+5.9					
						O PROGRAMMING & SYB	1-4	3 5/8	0	0.0	O TESDATA SYSTEMS CP	3-10	9 1/8	+1/2	+5.7					
						O REYNOLDS & REYNOLD	7-38	38	-1/4	-0.6	N TIMEPLEX INC	7-24	21	-5/8	-2.8					
						O SET CORP	21-50	48 3/4	-3/4	-1.3	O VISUAL TECHNOLOGY	9-19	18 1/2	+1/4	+1.1					
						O SHARED MEDICAL SYST	13-30	30 1/4	+1	+3.4	O WILTR INC	1-2	2 1/8	+1/8	+6.2					
						O SCIENTIFIC COMPUTERS	8-13	11 3/4	0	0.0										
						O SOFTWARE AG	5-17	10 7/8	-1/4	-2.2										
						N TYPESHARE INC	12-30	21 3/4	-1/2	-5.4										
						B URS CORP	4-8	8 1/4	+5/8	+8.4										
						N WYLY CORP	7-13	8 3/4	-3/8	-3.7										
SUPPLIES & ACCESSORIES																				
N AMERICAN BUS PRODS	11-21	20 1/2	0	0.0																
O BALTIMORE BUS FORNS	1-2	1	-1/4	-20.0																
BARRY WRIGHT	13-25	21	-3/8	-4.3																
O CYBERNETICS INC	1-1	1 1/4	+1/4	+25.0																
A DUPLEX PRODUCTS INC	12-20	18 1/2	-1/4	-1.3																
A EMWIS BUS FORMS	18-30	27 1/4	+1/4	+0.9																
N FM COMPANY	48-80	79 3/4	-1/4	-0.6																
N MOORE CORP LTD	26-48	44 1/4	-1/4	-2.7																
O NORTON INC	18-24	18 1/8	+1/2	+4.4																
O STANDARD REGISTER	22-78	78 1/2	+1/2	+10.4																
A TAB PRODUCTS CO	12-34	31 7/8	0	0.0																
N WALL BUS FORMS	22-56	55	+1/8	+3.0																
PERIPHERALS & SUBSYSTEMS																				
P AM INTERNATIONAL	2-4	4 3/4	+1/4	+7.1																
A ANDERSON JACOBSON	9-26	20 1/8	-7/8	-4.1																
O AUTO-TROL TECHNOLOGY	7-21	18 1/2	-1/2	-2.5																
O BANCAT INC	7-31	14	-1/2	-3.4																
A BEEMIE INT'L	4-10	8 1/4	-1/2	-5.1																
A BOLT-BERANEK & NEW	13-40	36	-3/8	-0.9																
O CAMDEX CORP	2-12	4 1/4	0	0.0																
N CENTRONICS DATA CORP	6-18	17 5/8	+5/8	+3.6																
A CETEC CORP	4-8	7 3/8	-1/8	-1.6																
O COGNITRONICS	2-12	12 3/4	-1/4	-2.8																
O COMPUTER COMMUN.	1-2	1 3/8	+5/8	+8.3																
EXC: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=LONG BEACH; H=HAWAII; D=DENVER; C=CHICAGO D-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID 1-1 TO NEAREST DOLLAR																				

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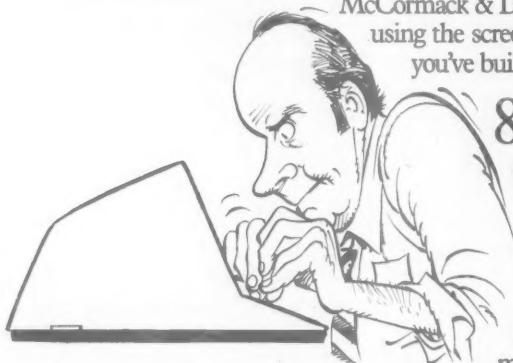
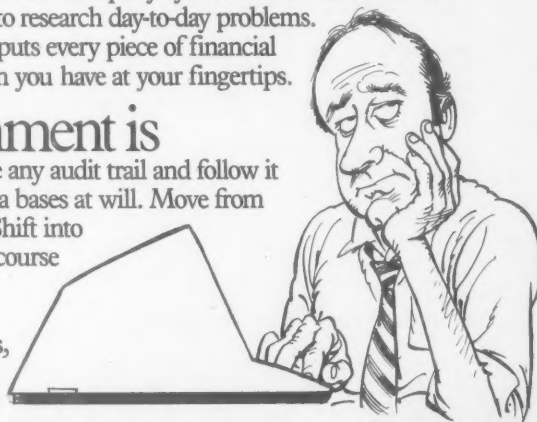


8:00 a.m. The boss says sales expenses are too high.

HiLite is a true accounting breakthrough. It lets you come up with answers in minutes instead of hours or days. No on-line query system in the world matches its ability to research day-to-day problems. It literally puts every piece of financial information you have at your fingertips.

8:02 a.m. Travel and entertainment is out of whack.

With HiLite, you can choose any audit trail and follow it to completion, criss-crossing data bases at will. Move from General Ledger to Accounts Payable to track sales expenses. Shift into Fixed Assets to pinpoint depreciation discrepancies. Change course 180 degrees and probe Personnel/Payroll for minority quota details. Search backwards and forwards through any and all McCormack & Dodge systems, using the screens that you've built.



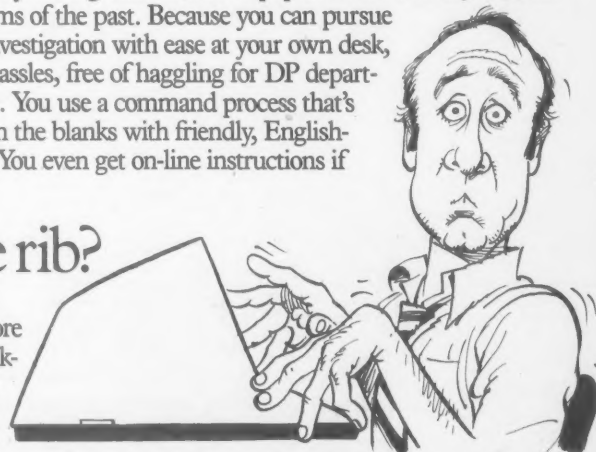
8:04 a.m. Let's look at salesmen's expense reports.

Remember overnight turnaround times? Remember inching your way through mountains of paper? With HiLite, these are problems of the past. Because you can pursue your investigation with ease at your own desk, free of hassles, free of haggling for DP department time. You use a command process that's

as natural as your normal thought process. You just fill in the blanks with friendly, English-like instructions, and your answer pops up on the tube. You even get on-line instructions if you hit a snag, simply by pressing a button.

8:06 a.m. \$1,000 for prime rib?

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